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This research was initiated to determine the rates of uptake, by a Thalassia testudinum ecosystem, of Cd, Cr, Cu, Ni, Pb, and Zn which were leached from sewage sludge by seawater. The experimental design used aerated flowing seawater (8.4ℓ Min^{-1}), which passes over a 0.1^3 bed of sewage sludge before traversing the model ecosystem. The tanks, both control and experimental, were 9.2 m x 0.9 m x 1.1 m in size with a volume of 3.1×10^3 liters. Each tank contained sand to a depth of 0.5 m for a total volume of 4.2 m^3. The experiment ran for 125 days from March, 1975 to July, 1975 and was duplicated from December 1975 to April 1976.

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BIOLOGICAL AVAILABILITY OF POLLUTANTS TO MARINE ORGANISMS

by

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FOREWORD

The Environmental Research Laboratory of the U.S. Environmental Protection Agency is located on the shore of Narragansett Bay, Rhode Island. In order to assure the protection of marine resources, the laboratory is charged with providing a scientifically sound basis for Agency decisions on the environmental safety of various uses of marine systems. To a great extent, this requires research on the tolerance of marine organisms and their life stages as well as of ecosystems to many forms of pollution stress. In addition, a knowledge of pollutant transport and fate is needed.

The waters of coastal marine environments, as well as the inshore sediments, often become the ultimate sinks for pollutants released into them from industrial sources. Plants and animals in those areas are subjected to varying concentrations of the contaminants which can be taken up, transported, and made available to upper trophic levels including man. Studies as the one reported herein help to develop and test predictive models on the bioavailability, uptake, and transport of toxic substances in marine tropical systems.

This small scale experiment serves as an initial step to assess the impact of pollutants in larger aquatic environments.

Eric D. Schneider
Director
Environmental Research Lab./Narragansett, RI

ABSTRACT

This research was initiated to determine the rates of uptake, by a *Thalassia testudinum* ecosystem, of Cd, Cr, Cu, Ni, Pb, and Zn which were leached from sewage sludge by sea water. The experimental design used aerated flowing sea water (8.4ℓ min^{-1}), which passed over a 0.1 m^3 bed of sewage sludge before traversing the model ecosystem. The tanks, both control and experimental, were 9.2 m x 0.9 m x 1.1 m in size with a volume of 3.1 x 10^3 liters. Each tank contained sand to a depth of 0.5m for a total volume of 4.2 m^3. The experiment ran for 125 days from March 1975 to July 1975 and was duplicated from December 1975 to April 1976.

The largest net uptake of metals occurred in the "fouling organisms" where Cd, Pb, and Zn uptake closely paralleled the net loss of metals from the sewage sludge. *Thalassia* leaves showed a net uptake for Cr, Pb, Ni, and Zn for both experiments. The urchin (*Lytechinus variegatus*), a herbivore on *Thalassia* leaves, also demonstrated a net uptake of Cu, Cr, Pb, Zn, and Ni in both experiments. The sea cucumber (*Holothuria mexicana*) in both experiments showed a net uptake of Cr, Cu, Pb, and Zn. Net uptake of metals in mangroves (*Rhizophora mangle*) was limited to the roots. In the first experiment Ni and Zn showed a significant uptake whereas in the second experiment only Cr demonstrated a net uptake. The uptake in mangrove roots appeared to be a direct function of metal concentration in the sediment. The lack of apparent metal uptake in the sediment, except for Ni, Pb, and Zn in the second experiment, was probably due to the sampling technique rather than to a lack of uptake of metals by the sediment.

No consistent or significant metal uptake was found for the clam (*Codokia orbicularis*), oyster (*Crassostrea rhizophora*) or the snail (*Nerita tessplata*).

The lack of sufficient sample mass, for these organisms, probably obscured any net uptake that may have occurred.

The results indicate that the dumping of sewage sludge in coastal tropical waters can lead to the uptake and concentration of toxic trace metals by members of a turtle grass community.

CONTENTS

Foreword...ii

Abstract...iii

Figures..v

Tables...viii

Acknowledgment...ix

1. Introduction..1

2. Methods...4

    Construction of sea water tanks............................4
    Sewage sludge..5
    Sampling...5
        organisms..5
        overlying water..6
        pore water...7
        sediment...7
        dissolved and particulate trace metals.................7

    Physical and chemical analyses.............................7
        general..7
        oxygen, temperature and salinity.......................8
        dissolved reactive phosphate...........................8
        particulate trace metals...............................8
        soluble trace metals...................................8
        biological and sediment samples........................9

3. Results...12

4. Discussion..16

5. Conclusions and Recommendations.............................20

Bibliography...64

Appendices

A. Sorted raw data, Experiment I and II........................68

B. Results for net uptake for Experiment I and II..............91

C. Experiment II, water data...................................131

D. Wet/dry ratios for all samples..............................133

FIGURES

Number		Page
1	Study site location	21a
2	Diagram of experimental design, tank configuration, and sea water system	22
3	Flow chart of trace metal and hydrocarbon sampling from collection processing into final sample form	23
4	Dissolved reactive phosphate concentration Experiment I and II, control	24
5	Dissolved reactive phosphate concentration Experiment I and II, experimental	25
6	Mean net uptake of Cd between experimental and control, fouling organisms and sewage-Experiment I	26
7	Mean net uptake of Cd between experimental and control, fouling organisms and sewage-Experiment II	27
8	Mean net uptake of Cu between experimental and control, fouling organisms and sewage-Experiment I	28
9	Mean net uptake of Pb between experimental and control, fouling organisms and sewage-Experiment I	29
10	Mean net uptake of Pb between experimental and control, fouling organisms - Experiment II	30
11	Mean net uptake of Zn between experimental and control, fouling organisms and sewage-Experiment I	31
12	Mean net uptake of Zn between experimental and control, fouling organisms and sewage-Experiment II	32
13	Mean net uptake of Ni between experimental and control, fouling organisms and sewage-Experiment II	33

14 Mean net uptake of Cr and Ni between experimental and control, sewage - Experiment I.................. 34

15 Mean net uptake of Cr between experimental and control, fouling organisms and sewage-Experiment II.................................... 35

16 Mean net uptake of Cu between experimental and control, *Thalassia* leaves and urchin guts-Experiment I.................................... 36

17 Mean net uptake of Cu between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 37

18 Mean net uptake of Cr between experimental and control, *Thalassia* leaves and urchin guts-Experiment I.................................... 38

19 Mean net uptake of Cr between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 39

20 Mean net uptake of Pb between experimental and control, *Thalassia* leaves and urchin guts-Experiment I.................................... 40

21 Mean net uptake of Pb between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 41

22 Mean net uptake of Ni between experimental and control, *Thalassia* leaves and urchin guts-Experiment I.................................... 42

23 Mean net uptake of Ni between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 43

24 Mean net uptake of Zn between experimental and control, *Thalassia* leaves and urchin guts-Experiment I.................................... 44

25 Mean net uptake of Zn between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 45

26 Mean net uptake of Cd between experimental and control, *Thalassia* leaves and urchin guts-Experiment II.................................... 46

27 Mean net uptake of Ni between experimental and control, *Thalassia* roots and mangrove roots-Experiment I.................................... 47

28 Mean net uptake of Ni between experimental and control, *Thalassia* roots and mangrove roots-Experiment II.................................... 48

29 Mean net uptake of Cr between experimental and control, *Thalassia* roots - Experiment I............. 49

30 Mean net uptake of Cr between experimental and control, Thalassia roots and mangrove roots-Experiment II....................................50

31 Mean net uptake of Cu between experimental and control, Thalassia roots - Experiment I............51

32 Mean net uptake of Cu between experimental and control, Thalassia roots and mangrove roots-Experiment II....................................52

33 Mean net uptake of Pb between experimental and control, Thalassia roots - Experiment I............53

34 Mean net uptake of Pb between experimental and control, Thalassia roots and mangrove roots-Experiment II....................................54

35 Mean net uptake of Zn between experimental and control, mangrove roots - Experiment I.............55

36 Mean net uptake of Zn between experimental and control, Thalassia roots and mangrove roots-Experiment II....................................56

37 Mean net uptake of Cd between experimental and control, Thalassia roots - Experiment II...........57

38 Mean net uptake of Cr and Ni between experimental and control, sea cucumber guts - Experiment I......58

39 Mean net uptake of Cd and Cr between experimental and control, sea cucumber guts - Experiment II.....59

40 Mean net uptake of Cu between experimental and control, sea cucumber guts - Experiment I..........60

41 Mean net uptake of Cu and Ni between experimental and control, sea cucumber guts - Experiment II.........61

42 Mean net uptake of Pb and Zn between experimental and control, sea cucumber guts - Experiment I..........62

43 Mean net uptake of Pb and Zn between experimental and control, sea urchin guts - Experiment II...........63

TABLES

Number — Page

1 Physical dimensions, number stocked and sample size of animals, Experiment I and II................ 5

2 Taxonomic list of experimental organisms.............. 6

3 Results of trace metal analyses of NBS biological standards, with minimum detectable concentrations...10

4 Initial trace metal concentrations of sewage sludge, Experiment I and II...............................15

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SECTION I

INTRODUCTION

The deposition of sewage sludge in the marine environment may adversely affect the resident organisms in three ways: (1) Siltation with resultant death of sessile organisms. (2) Production of an anoxic environment due to the oxidation of the large organic load in the sludge. (3) By the release of toxic materials into water in forms that may be incorporated into the organisms. These materials usually include metals (zinc, cadmium, chromium, nickel, lead and copper), pesticides or organohalogens and hydrocarbons of petroleum origin. The mass dumping of treated sewage sludge into oceans and shallow inshore areas is occurring in a number of areas. The New York Bight, is an example of an area receiving large quantities of solid waste for almost a century (Carmody et al., 1973). Carmody, Pearce, and Yasso (1973) determined that there was a definite increase in the sediment of Cr, Cu, Pb, Ni and Zn due to the dumping of sewage sludge. The concentration of Cr, Cu, Cd, Pb, Ni, and Zn in sewage sludge is markedly elevated over ambient marine water concentrations (Salotto, B.V. and Farrell, J.B., 1971; Jacobs, S.A., 1973). Therefore, the deposits of this sludge in the marine environment could result in the uptake and concentration within the food web. The uptake of metals by marine organisms and concentration within the food web has been demonstrated numerous times (Jacobs, S.A., 1973; Kerfoot and Jacobs, 1973a, 1973b; Kerfoot, W.B., 1973; Shuster and Pringle, 1969; Valiela et al., 1974).

The most extensive compilation of metal concentrations in the tissues of marine organisms is found in Vinogradov (1953) and Goldberg (1965). However, the results were usually based on very small sample sizes so it is very difficult to assess the background levels of metals in marine organisms. Eisler (1973) compiled an annotated bibliography on biological effects of metals on aquatic organisms. Montgomery et al. (1976) found that in order to obtain a valid sample size for trace metal determination in the thread fin herring (Opisthonema oglinum Le Sueur)) a pooled sample size of from 50 to 124 fish was necessary in order to detect a 15 to 25 percent difference in two populations. Other researchers have shown the effect of various metals on the marine food web or individual organisms both in laboratory models and field experiments (Phelps, D.K. et al., 1975; Nair, K.V. et al., 1973; Eisler, R. et al., 1972;

Eisler, R., 1971; Gardner, G.R. and G. LaRoche, 1973; Jackim, E., 1973; Frazier, J.M., 1976; Ferrell, R.E. *et al*., 1973; Huggett, R.J., 1973; Hannan, P.J. and C. Patouillet, 1972). Schroeder (1975) demonstrated, using radioactive isotopes, that *Thalassia testudinum* would concentrate cobalt and manganese in the leaves rather than the root structure (excluding rhizomes). The incorporation of cations in *Thalassia testudinum* was primarily accomplished through the leaves (Schroeder, 1975).

The use of sewage sludge to amend agricultural soils has been extensively studied (Street, J.J. *et al*., 1977; Silviera, D.J. and L.E. Sommers, 1977; Turner, R.E. *et al*., 1976). However, very little has been published regarding the rates of release of potentially toxic trace metals into complex tropical ecosystems. The necessity for this type of controlled field experiments was explained by Menzel (1977) for the CEPEX experiment. Inherently, it is impossible to duplicate exactly the marine ecosystem due to its spatial and temporal dimensions. Also, the isolation of organisms from their surrounding environment produces results that are ambiguous. Therefore, it is unlikely that any "artificial" system can duplicate conditions in the natural environment.

It may not be necessary to duplicate in a laboratory the real system, but rather to produce a system that can duplicate itself (Menzel, D.W., 1977), while at the same time attempting to duplicate the gross physical marine parameters, such as light, suspended sediment load, salinity and temperature. In order to do this, a flow-through sea water system with replicate experiments in different seasons is mandatory.

Our objectives in this research were to use a flow-through system of sufficient size and complexity as to nearly duplicate a tropical marine ecosystem and also allow repeatability over varying seasons. This system would allow us to determine the rates of uptake, by a tropical marine community, of Cu, Cd, Cr, Zn, Ni, and Pb which were leached from sewage sludge by sea water. This community was comprised of turtle grass (*Thalassia testudinum*) with its associated sedimental infauna, spiny sea urchin (*Lytechinus variegatus*), sea cucumber (*Holothurea mexicana*), attached "fouling organisms", plankton and the red mangrove (*Rhizophora mangle*).

This ecosystem was chosen for three reasons: (1) the system comprised a tightly bound community with strong interaction between the members, (2) the important role of the seagrass/mangrove ecosystem in the overall tropical near-shore environment (Jones, J.A., 1968; Odum, H.T. *et al*., 1959; Golley, F. *et al*., 1962), (3) the possibility of the active concentration of these trace metals in the higher trophic levels with passage of the materials through the food webs.

The results from this research will aid in forming a basis for determining the potential effects of leached toxicants from sewage sludge on a tropical marine ecosystem. These problems are especially critical in Puerto Rico. The population density on the island is nearly 2000 people per square kilometer; about ten times that of the continental United States. Only a few towns and cities have sewage treatment facilities and most of the sewage is dumped, minimally treated, into the rivers and bays.

With the increased awareness of the potential detrimental effects of raw sewage on the health of the inhabitants and the marine ecosystem, the construction of sewage plants will increase. This increase of modern plants will produce large amounts of sewage sludge. The disposal of this sludge will pose an especially critical problem in the densely populated, mountainous island of Puerto Rico as the available land for sludge disposal is very limited and disposal poses its own set of ecological problems at least as serious as marine disposal of sludge. Therefore, the judicious selection of ocean dump sites for sludge, if this alternative is chosen, will require estimates on the leaching rates of toxic substances from sewage sludge by sea water. These substances can enter the food web and become concentrated relative to the concentration in the water column. The toxicity to marine organisms of Cd, Pb, Cr, Ni, Zn and Cu has been demonstrated (Eisler, R., 1971; Eisler, R. et al., 1972; Frazier, J.M., 1976; Gardner, G. and LaRoche 1973; Ikuta, K., 1968). It is also possible that some of the leachable substances could promote growth in portions of the ecosystem, i.e., vitamins, chelators, organic growth substances (Vallentyne, J.R., 1957). However, the potential possible benefits of sewage sludge leachate will not be examined in this research.

SECTION 2

METHODS

Construction of Sea Water Tanks

The sea water system and tanks were located near Bramadero Bay, approximately 8 km from Mayaguez, Puerto Rico (Fig. 1). Two tanks (9.2 m x 0.9 m x 1.1 m) were constructed from 1.9 cm exterior grade plywood with 5 cm x 10 cm external framing (see Fig. 2). These tanks were sealed with two coats of fibreglass epoxy resin and leached in running sea water for 2 weeks. The tanks were located in an open structure. The roof of the structure was fabricated of galvanized corrugated roofing. The underside of the roof was covered with plastic sheeting to prevent zinc contamination.

Flowing Sea Water System

Each tank was filled with 4.2 m^3 of calcareous beach sand (7% $CaCO_3$) from Aguada, Puerto Rico. The mean depth of sand was 0.5 m with an additional 0.1 m of sand over the last 3 m of tank. The tanks were then filled with sea water to a mean depth of 0.5 m and flushed for an additional week.

The sea water for the system was pumped from the dock of the Center for Energy and Environment Research at a depth of 3 meters. The pump was a Sears Dynaglas ^{R} 1 hp (230 volt). A plastic minnow trap was used as a course prefilter for a Filterchem ^{R} combination filter and foot valve at the pump inlet. All piping used was grey schedule 40 P.V.C. The water traversed 73 m to a charcoal, sand and gravel filter (0.5 x 0.5 x 1.0 m), then to a 1000 liter settling tank. The settling tank was constructed of 1.9 cm thick plywood lined with two coats of fibreglass ^{R} and epoxy resin. The water was then gravity fed to the two sea water tanks with the flow split using P.V.C. "T" joints. The flow rate in each tank was monitored and maintained at 8.2 to 8.7 $\ell\ min^{-1}$ by PVC ballvalves. The total water volume was 3.1 x 10^3 liters. The turnover time was 5.9 hrs per tank. The inflowing water was diverted below the surface by submerging the inflow end using a perforated inflow pipe (Fig. 2). The sea water was continuously aerated with an air pump and air stones.

Sewage Sludge

Activated sludge was shipped from New York City in 208 ℓ polyethylene lined drums. The sludge was allowed to settle and the overlying liquid decanted. In general, sludge is 5% solids. The black, "oily" sludge slurry remaining was mixed in a large fiberglas tank. The sludge was added to a depth of 7.6 cm in an area 1 m wide by 2.3 m long (0.1 m^3) at the incurrent end of the Experimental tank which had previously been sealed off from the rest of the tank. A PVC frame with small mesh screen attached was placed over the sludge to prevent direct contamination of the organisms. A duplicate screen was placed in the control tank. After 24 hrs, when the sludge had settled, the seal was removed and Experiment I was begun. At days 1, 5, 25, 50, 85 (Experiment II only) and 125, after the sludge was added to the Experimental tank, samples of organisms, sediment, sludge (day 1, 125 EXPI) and water were taken from both tanks. A presample was taken prior to addition of any sludge, in this study it is referred to as day 0.

Sampling Organisms

The initial stocking quantity or density for the biological organisms, used in both Experiment I and II, is shown in Table 1.

TABLE 1. PHYSICAL DIMENSIONS OF ORGANISMS WITH NUMBER OF TOTAL ORGANISMS STOCKED PER TANK AND NUMBER OF ORGANISMS SAMPLED PER TANK PER DAY

EXPERIMENT I

		Experimental Tank					Control Tank				
		L	W	H	#stocked	#/Sample*	L	W	H	#stocked	#/Sample*
Clams	$\bar{x}$	38.3	33.5	15.1	104	10/20	39.3	36.8	17.2	104	10/27
	S.D	7.3	6.2	3.2			7.1	25.7	17.2		
Sea Cucumbers	$\bar{x}$		35.8	29.2	110	9/35		35.9	29.4	101	9/29
	S.D		9.6	7.8				9.1	8.0		
Snails	$\bar{x}$	15.3	11.4		124	10/16	15.3	11.4		115	10/–
	S.D	1.6	1.4				1.5	1.1			
Oysters	$\bar{x}$	32.6			159	8/–	33.2			158	8/–
	S.D	7.5					8.3				
Urchips	$\bar{x}$		47.3	27.7	73.	5/14		46.0	26.8	72	5/16
	S.D		6.8	4.6				6.4	4.0		

EXPERIMENT II

		Experimental Tank					Control Tank				
		L	W	H	#stocked	#/Sample*	L	W	H	#stocked	#/Sample*
Clams	$\bar{x}$	40	34.6	15.8	106	10	39.3	36.1	15.4	106	10
	S.D	7.5	6.3	3.4			7.5	7.4	3.2		
Sea Cucumbers	$\bar{x}$		44.6	35.8	52	5		44.5	35.2	52	5
	S.D		12.8	10.4				13.4	10.4		
Snails	$\bar{x}$	15.7	11.6		180	20	15.5	11.5		180	20**
	S.D	1.1	0.7				1.1	0.8			
Oysters	$\bar{x}$	30.0			132	10	38.6			131	10
	S.D	9.2					9.5				
Urchins	$\bar{x}$		45.8	29.2	57	5		47.4	29.7	57	5
	S.D		5.2	4.0				5.7	3.5		

*Upper values are for days 0 through 50, Experiment I, lower values for day 125. Numbers refer to number of organisms in each pooled sample.

**Snails not taken on day 125 control as none left.

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The organisms, except for the clams, were all collected using manual techniques at Pta. Ostiones, Puerto Rico. The organisms were allowed to equilibrate for 2 weeks in the flowing sea water system. The turtle grass was replanted manually at 400 plants m^{-2}, after soaking in a 10% NAPDH solution (Kelly et al., 1971). The clams were collected at Pta. Viento on the southeast coast of Puerto Rico.

Mangroves in Experiment I (230 seedlings) were planted as ungerminated seedlings and as germinated seedlings in Experiment I (120 seedlings).

Oysters in Experiment I, were placed in tanks and suspended in one plastic mesh bag per tank. In Experiment II the oysters were placed 13 per bag, for a total of 10 bags per tank. The location of the bags was randomized except no bag was hung directly over the sewage sludge deposit.

Table 2 is a species, common name list of plants and animals used for this study.

TABLE 2

Common name	Species
Clam	Codokia orbicularis
Oyster	Crassostrea rhizophora
Snail	Nerita tessplata
Sea cucumber	Holothurea sp. (predominently H. mexicana)
Urchin	Lytechinus variegatus
Turtle grass	Thalassia testudinum
Red mangrove	Rhizophora mangle

After equilibration, organisms were sampled at the prescribed intervals, the samples were removed, physical measurements made, placed in double bags and frozen. Simultaneously, samples were collected for hydrocarbon analyses. The samples for hydrocarbon analyses were placed in glass bottles with aluminum foil seals, capped and frozen. The bottles were previously rinsed with 2N HCℓ, deionized water, $CCℓ_4$, and air dried. The physical dimensions for the animals sampled and number of animals sampled per day are shown in Table 1.

Overlying Water

Water samples were taken, for Experiment I and II, prior to biological samples. There were three types of water samples taken: pore water for analysis of soluble trace metals and hydrocarbons, overlying water for soluble and particulate trace metals and hydrocarbons, and dissolved reactive phosphate (DRP). The DRP was sampled at weekly intervals. The trace metals and hydrocarbons in water and pore water were sampled at the same intervals as the organisms. Pore water samples were not taken in Experiment II.

Pore Water

Samples were taken using one-inch PVC pipes sealed at one end with 0.8 mm holes drilled in the lower 38 cm of the pipe. The pipes were placed 46 cm from the sides at 1.2, 3.5, 5.8, and 8.1 m from the intake end of the tanks. Two liter water samples were withdrawn using 6.4 mm Tygon ^{R} tubing and 25 lbs of vacuum pump.

Sediment

Sediment was collected using a 2.5 cm diameter x 25 cm PVC core. The sediment core was homogenized and ground after drying (105°C) and a 1 g sample taken for trace metals. After day 25 in Experiment I and throughout Experiment II, a 5 g sample was taken for trace metals.

Dissolved and particulate trace metals

All water samples were placed in 2.5 ℓ glass bottles (which formerly contained conc. HNO_3 or HCℓ) which were equilibrated in reagent grade sea water for 12 hrs prior to sampling (4 ℓ samples for Experiment II). The sample bottles were drained, rinsed with the sample, filled, then filtered within 4 hrs. The filtering was accomplished using an all plastic filter system containing a .4 μm pore size, 142 mm diameter, Gelman ^{R} filters. The filters were previously washed in 6 N HCℓ and rinsed with copious amounts of R.O./D.I. water. The fraction retained on the filter was referred to as the "particulate" portion. The filtrate was the "soluble" fraction.

Physical and Chemical Analyses

General

All reagents used are reagent ACS grade. All glassware was cleaned with detergent, rinsed with water from a Millipore^{R} "Milli-Q" system. All water referred to in this paper is R.O./D.I. water from the Millipore ^{R} "Milli-Q" system. This refers to the technique of reverse osmosis followed by ion-exchange. The final cleaning for glassware used to digest samples for trace metal analysis involved refluxing the covered beakers with concentrated HNO_3 followed by rinsing with R.O./D.I. water.

All other equipment was washed with detergent, rinsed with R.O./D.I. water, followed with 6N HCℓ and rinsed with R.O./D.I. water. Only non-metallic instruments and materials were used and all equipment, after cleaning, was stored covered with Parafilm ^{R} or plastic bags.

Oxygen, temperature, and salinity

A Yellow Springs International YSI - 57 oxygen/temperature meter was used. The oxygen output was both salinity and temperature compensated. The oxygen calibration was checked using the Winkler titration technique (Strickland and Parsons, 1965).

Dissolved reactive phosphate

One hundred mℓ samples were collected and immediately filtered through a Millipore Swin-Loc ^{R} adaptor containing an acid washed (6N HCL) 27 mm Millipore, 0.45 m pore size filter using an acid washed 100 mℓ polypropylene syringe. The sample was frozen and later DRP was determined using the single solution technique (Strickland and Parsons, 1965) with a 10 cm cell in a Beckman DU spectrophotometer. A small number of samples were run on a Technicon autoanalyzer using standard Technicon procedures (Zimmermann, C. *et al*., 1977).

Particulate trace metals

The 142 mm diameter filters were placed in Pyrex ^{R} beakers, 6 mℓ of concentrated HNO_3 : HCℓ (3:1) were added and the beaker covered with a ribbed watch glass. The solution was heated to a slow boil (less than 95°C), when the filters dissolved, the liquid was brought to a rapid boil and taken to near dryness. Then, 4 mℓ concentrated HNO_3 were added, followed by dropwise addition of 1 mℓ of H_2O_2 (30% by volume). The sample was then reboiled to near dryness and 3 drops of concentrated H_2SO_4 were added. If the sample turned black, more H_2O_2 was added. The samples were dried until SO_3 fumes disappeared. The sample was then brought to 10 mℓ volume with R.O./D.I. water.

Soluble trace metals

After 2.5ℓ of sample was filtered for determination of "particulate" trace metals (41 in Experiment II), the effluent was run through two 1.2 cm diameter x 10 cm glass columns. The flow rate was maintained at 1 mℓ min^{-1} cm^{-2}. The columns were in series and the first column contained 10 mℓ of Chelex-100 ^{R} in the ammonium form (20 mℓ in Experiment II) with 20 mℓ of Amberlite XAD-2^R resin (Rohm and Haas) in the second column. The Chelex resin was purified by 2 bed volumes (BV) of 1NHCℓ (isothermally distilled) followed by 5 BV of D.I./R.O. water and then 2 BV 1N NH_4OH (isothermally distilled) with a final wash of D.I./R.O. water. The Amberlite XAD-2 resin was cleaned by washing for 10 minutes with D.I./R.O. water. The water was decanted and the procedure repeated 5 times. The resin was washed four times with anhydrous methanol followed by four washes with D.I./R.O. water. The Chelex resin was left covered with water prior to use. The Amberlite was stored under methanol until just prior to use.

In Experiment I and II, the metals were extracted from the Chelex-100 ^{R} resin after the resin column was first washed with 100 mℓ of water. The trace metals, in EXP 1, were eluted with 40 mℓ of boiling concentrated HCℓ. The resin was rinsed with 20 mℓ of water and this water was combined with the acid eluate. The eluate was boiled down (95°C) to 1 mℓ and then brought to 10 mℓ volume with water. This was referred to as the soluble inorganically complexed fraction. In Experiment II, the Chelex 100 was eluted batchwise using 6 mℓ concentrated HNO_3 per 10 mℓ resin (Davey, E.W. and A.E. Soper, 1975) rather than eluting with concentrated HCℓ. The Chelex resin was filtered and the acid eluate dried to 1 mℓ followed by the addition of 6 mℓ 2NHCℓ (isothermally distilled) and dried down to 1 mℓ. This was repeated and the final product was diluted to 10 mℓ with distilled water. The Amberlite ^{R} resin was first washed with 100 mℓ water then the resin was placed in an open glass Petri dish, rinsed with methanol, and the resin ignited. The ignited resin was placed in a muffle oven and the temperature raised in 100°C increments until 400°C. The resin was maintained at 400°C for 1 additional hour then the temperature was raised to 450°C for 24 hours. The cooled resin was dissolved in 5 mℓ 1NHCℓ, then boiled down to 1 mℓ and brought to the desired final volume. This fraction was referred to as the soluble, organically complexed trace metal (Montgomery, J.R. and J.E. Echevarría, 1975). The trace metals were determined by atomic absorption spectrophotometry (A.A.S.) on a Perkin-Elmer Model 303 A.A.S with a deuterium background corrector. The output was recorded using a Model 56 Perkin-Elmer recorder and DCR-1 digital readout. The flow chart for sample collection and processing is shown in Fig. 3.

Biological and sediment samples

Analyses of National Bureau of Standards (NBS) bovine liver and orchard leaves were performed along with the regular samples. One gram samples were used, when available, for all standards and samples (see Table 3). The flow chart for sample collection is shown in Figure 3.

The number of organisms sampled per day per experiment is shown in Table 1. The samples were defrosted after collection and dissected into the following tissues using Pyrex glass shards and plastic gloves.

Urchins - shell and internal tissues.

Sea cucumbers - body, muscle bands and internal tissues. In Experiment II, muscle bands were combined with internal tissues.

Snails, clams, oysters - shell and internal organs.

Fouling organisms - total mass scraped from glass collecting plates (23 x 30 cm). In Experiment I, all plates were sampled at each sampling time. In Experiment II, cumulative results were obtained by sampling plates which had remained in the tanks for 25, 50, 85, 125 days after addition of sludge.

Thalassia - Roots and leaves. The roots and rhizomes were combined and are referred to as roots.

Mangroves - The lower 3.8 cm of the hypocotyl not including the roots. This is referred to in this paper as the bottom. Growing stem includes all of the primary meristamatic tissue from the hypocotyl excluding the leaves and the roots/rhizomes.

After dissection into these various parts, the wet weight was obtained. The samples were dried in covered, cleaned Pyrex beakers at 105°C. The dried sample was weighed, then homogenized using a ceramic mortar and pestle.

TABLE 3. RESULTS IN μg g^{-1} DRY WEIGHT FOR DETERMINATION OF METALS IN NBS BOVINE LIVER AND ORCHARD LEAF STANDARDS. THE RESULTS FOR EXPERIMENT I AND II ARE SHOWN WITH STATISTICS AND OUR COMPUTED MINIMUM DETECTABLE CONCENTRATION (MDC).

			EXPERIMENT I Bovine Liver			
	Cd	Cu	Cr	Pb	Zn	Ni
MDC	0.3	8.9	3.4	0.5	2.8	0.9
$\bar{x}$	0.56	177	<MDC	2.5	132	-
SD	0.26	20.2		.96	31.7	
N	9	10		10	12	
			EXPERIMENT II			
	Cd	Cu	Cr	Pb	Zn	Ni
$\bar{x}$	0.55	187.4	<MDC	<MDC	131.7	1.0
SD	0.45	15.50			17.59	0.68
N	49	41			53	48
NBS values	0.27 ± .04	193 ± 10	-	0.34 ± 0.08	130 ± 10	
			EXPERIMENT I Orchard Leaves			
$\bar{x}$	<MDC	12.3	2.6	44.8	26.1	3.9
SD		3.9	0.63	2.82	5.4	0.6
N		11	6	6	11	3
			EXPERIMENT II Orchard Leaves			
$\bar{x}$	0.66	11	-	45.0	25.6	4.0
SD	0.34	1.5		3.6	7.64	1.3
N	17	20		23	26	24
NBS values	0.11 ± .02	12 ± 1	(2.3)	45 ± 3	25 ± 3	1.3 ± 0.2

The ground sample, not used for analysis, was stored in plastic, screw cap bottles. The dried samples were placed in cleaned Pyrex beakers, at least 1g where possible, and were digested using the following procedure.

Twenty-five mℓ of a concentrated HNO_3: HCℓ mixture (3:1) was added to the dried, weighed sample in the covered clean beaker. The sample was slowly boiled and refluxed in the covered beaker at 90 to 95°C until 1 mℓ of solution remained. The sample was allowed to cool then 30 mℓ of 30% H_2O_2 was added slowly and reheated to 90-95°C until 1 mℓ of the solution remained. A further 10 mℓ of HNO_3:HCℓ mixture was added and reheated. The mixture was allowed to cool and 10 mℓ of 30% H_2O_2 was added. This was allowed to boil again (90-95°C). The 10 mℓ additions were repeated, if necessary, a maximum of three times. Six mℓ of 2N HCℓ were added, boiled at 90-95°C, until 3 mℓ were left. The sample was allowed to cool then centrifuged in a clean 50 mℓ plastic capped centrifuged tube at 1700 rpm for 20 minutes. The liquid was carefully decanted and brought to 10.0 mℓ with R.O./D.I. water. This sample was placed in clean, 25 mℓ polyethylene vials with caps.

SECTION 3

RESULTS

The raw data, expressed as µm metal/g dry weight for all samples, are found in Appendix A. The computed net uptake for each metal is located in Appendix B and is expressed as mean experimental results (µg/g dry weight) minus the mean control results for each sample, with their respective standard deviations, and degree of freedom. The "t" value for the null hypothesis, Ho: $M_1 - M_2 = 0$ ($P<0.05$) where M_1 is experimental and M_2 is control is also shown in Appendix B. The analyses for the NBS biological standards are shown in Table 3. The results for all fractions of dissolved and particulate trace metals in the water for both control and experimental tanks (Experiment II) are in Appendix C. The wet/dry weight ratios with statistics for all the samples in Experiment I and II are in Appendix D.

The experiments were replicated, Experiment I began on 11 March 1975 and ended 15 July 1975; Experiment II began on December 12, 1975 and ended April 26, 1976. The experimental tank refers to the tank with the sludge added and the control tank was identical, in experimental design, to the experimental tank except no sludge was added.

Temperature, salinity, and oxygen

In Experiment I the temperature ranged from 21 to 28°C with a salinity range from 32 to $34^{\circ}/_{oo}$. In Experiment II the temperature ranged from 21 to 26.5°C with a salinity range from 24 to $35^{\circ}/_{oo}$($\bar{x}$, $30^{\circ}/_{oo}$, S.D. $4.2^{\circ}/_{oo}$, N = 18).

Dissolved reactive phosphate (DRP)

The results are shown in Figs. 4 and 5 for control, Experiment I and II and experimental, Experiment I and II, respectively. The plotted points are the mean values for a five day period.

Fouling organisms

In Experiment I, Cd, Cu, Pb, and Zn showed a significant net uptake after 125 days (Figs. 6, 8, 9, 11), whereas in Experiment II, Pb (Fig. 10) showed a steady uptake to the end of the sampling period (85 days). For Experiment II, Cd and Ni demonstrated a steady uptake until day 50 (Figs. 7 and 13) then a decline in the net uptake. Zinc and chromium indicated a net uptake after day 50 (Figs. 12 and 15) and Cu showed little significant uptake for the sampling period (Appendix B).

Sewage sludge

The initial values for trace metals in sewage sludge are shown in Table 4.

A rapid decline was noted in the concentration of Cd, Cr, Cu, Ni, and Zn in the sewage sludge for Experiment I (Figs. 6, 15, 8, 14, 11). The Pb results are inconclusive for both experiments (Fig. 9 and Appendix B) due to the loss of lead as the easily volatilized $PbSO_4$ during the digestion of the sludge. Because of the shorter sampling interval for sludge in Experiment II, a two stage decline for Cd, Ni, and Zn was shown (Figs. 7, 13, 12). The first decrease in metal concentration was nearly instantaneous with a further, smaller decrease after day 50.

Thalassia

Leaves

The results of EXP I were biased due to the "die off" of the plants by day 50. This was probably due to insufficient light. The plants survived for the full 125 dav period in Experiment II after the light level was increased.

Copper, Cr, Pb, Ni and Zn showed rapid increases in net uptake in Experiment I (Figs. 16, 18, 20, 22, 14). In Experiment II the same overall trend of increasing net uptake was shown for Cu, Cr, Pb, and Cd for Experiment II (Figs. 17, 19, 21, 26). Nickel and zinc, in Experiment II did not show a significant uptake up to day 50 but the net uptake was significant at day 85 and 125 (Figs. 23, 25).

Root

The only significant net uptake of trace metals for _Thalassia_ roots and rhizomes in Experiment I was for nickel, Cr, Cu and Pb (Figs. 27, 29, 31, 33).

The repeat experiment also showed a significant net uptake for Cr and Zn (Figs. 30, 36) with Pb, Ni, and Cu showing peaks of significant net uptake values at day 5 and/or 25 days (Figs. 34, 28, 32). Cadmium uptake was significant only at day 25 (Fig. 37).

Urchin, internal organs

To facilitate later discussion, the results of the net uptake for urchins are shown with the results for _Thalassia_ leaves.

Copper, Cr, and Pb show a steady and rapid increase in net uptake for EXP I and II (Figs. 16, 17, 18, 19, 20, 21). The net uptake for Cd was not significant in Experiment I (Appendix B), however in Experiment II (Fig. 26) the net uptake increased after day 50. The results for nickel and Zn uptake are very similar in Experiment I and II (Figs. 22, 23, 24, 25, 26). Zinc shows a steady increase with a decrease, in net uptake, at day 50 followed by a rapid increase in both Experiment I and II.

Sea cucumber, internal organs

In both Experiment I and II, Cr, Cu, Pb and Zn showed very similar net uptakes over the 125 day period (Figs. 38, 39, 40, 41, 42, 43). Ni showed a net uptake spike at day 5 in Experiment I, and in Experiment II a spike showing uptake of nickel occurred at day 5, 50 and a smaller spike at day 125 (Figs. 38, 41).

Mangrove roots

Nickel, in Experiment I, shows an initial decrease in net uptake before day 50 with a gradual increase to day 125 (Fig. 27). The opposite occurs in Experiment II where the net uptake increases rapidly up to day 5 (Appendix B). The net uptake for Cr was not significant for Experiment I (Appendix B), but indicated a linear net uptake from day 50 to day 125 for Experiment II (Fig. 30). Lead uptake in Experiment I and II (Figs. 33 and 34) exhibits similar trends. However, Pb uptake is much higher in Experiment I (Fig. 33). Zinc, in Experiment I, also demonstrated a rapid linear uptake curve (Fig. 35) which was very similar to the uptake in Experiment II (Fig. 36). However, the net uptake was greater for Zn in Experiment I. The net uptake for Cu was not significant in Experiment I (Appendix B), but appeared to show a gradual uptake after day 50 followed by a decline to original levels (Fig. 32).

Other

No significant net uptake was shown for the oysters, clams, mangrove body, stem or leaves, snails, holothurian body and muscle parts or sediment for Experiment I or II. The results shown are in Appendix B. The significant results for net uptake of metals are shown in Figs. 6-43 and are indicated by open rectangles. Dark rectangles indicate non-significant results.

TABLE 4. CONCENTRATION OF Cd, Cr, Cu, Ni, Pb AND Zn IN µg/g DRY WEIGHT, IN SEWAGE SLUDGE USED IN THIS EXPERIMENT. THE RESULTS ARE FOR EXPERIMENT I AND II. RESULTS FOR THE SAME METALS AS DETERMINED BY SALOTTO AND FARRELL (1971) FOR ACTIVATED SLUDGE ARE INCLUDED.

EXPERIMENT I

	Cd	Cr	Cu	Pb*	Ni	Zn
$\bar{x}$	109	2120.	2560.	60	319	2926
SD	6.70	115.	124.0	55	11.3	388.4

EXPERIMENT II

	Cd	Cr	Cu	Pb*	Ni	Zn
$\bar{x}$	166.	3667	2445.	21.0	376.	2508
SD	85.5	338.5	266.4	3.29	12.7	122.1

SALOTTO AND FARRELL (1971)

	Cd	Cr	Cu	Pb*	Ni	Zn
$\bar{x}$	350	4330	1100	1500	380	3300

* Lead values are low due to digestion technique.

SECTION 4

DISCUSSION

Oysters and clams have been extensively studied regarding trace metal uptake because of their commercial significance, hardiness and feeding method. Bivalves, in general, show uptake and concentration of most trace metals (Kerfoot, W.B., 1973; Kerfoot, W.B. and S.A. Jacobs, 1973 a and b; Shuster, C.N. and B.H. Pringle, 1969; Huggett, R.J. et al., 1973; and Frazier, J.N., 1976). However, oysters and clams in our research showed no consistent nor significant net uptake of metal except possibly zinc and copper. In Experiment I, all the oysters were placed in a single net bag. This procedure was changed to ten net bags per tank in Experiment II. This drastically reduced the crowding and increased the survival of the oysters beyond day 50 in Experiment II. The wet weight of the clam and oyster internal organs was too small to allow an adequate sample size for the trace metal analyses. This same problem was encountered in the analyses for the snails, holothurian muscle parts in Experiment I, and zooplankton samples for both Experiment I and II.

The results for lead in the sewage sludge were very low compared to other investigators (Table 4) and are due to the addition of H_2SO_4 to aid in the digestion of the sludge organic matter. When the sample was heated, the lead was lost as volatile $PbSO_4$. The H_2SO_4 was only used for the digestion of the sludge.

The results for the analyses on the NBS bovine liver standards (Table 3) are in good agreement for Cu and Zn and high for Cd. Our results for Cr and Pb in bovine liver were below our detection limits. The results for NBS orchard leaves were in good agreement for Cu, Pb and Zn. Cadmium, in NBS orchard leaves, was too high as was nickel. The coefficient of variation (CV) for Ni was lower than the CV for Cd. The results for Cr, in orchard leaves, were in good agreement with the non-certified value for Cr published by NBS.

Our results for the concentration of trace metals in water for Experiment I were at or below the detection limits for nearly all metals and were therefore not shown. This was due to the 2.5 ℓ sample size. When we used 4 ℓ sample in Experiment II, the results for most of the metals were within our detection limits. However, no significant difference was noted between metal concentrations in the experimental tank and those in the control tank. Obviously, metals were released from the sludge, as shown by the results in Figs. 6 through 15 and, also, by the significant net uptake of metals by *Thalassia* leaves and roots, urchin and sea cucumber internal parts, and fouling organisms. This net uptake in organisms was hard to explain when no net change was seen in the water of the experimental tank. The problem in interpretation of the water results was due to the "point sampling" of the water versus the "integrated" sampling for the organisms, sediment, and sludge. The "point" concentration of the water was very low at any one time (Appendix C). These trace concentrations, coupled with the high blanks and matrix problems in trace metal analyses of sea water by flame atomic absorption spectrophotometry, produced results with very high within-sample variance. This high variance effectively obscured any differences between the experimental and control tanks in Experiment II. Schuster and Pringle (1969) demonstrated that the concentration of metal in the water, at any one time, may not be the best indicator of the total contamination by metals.

The net uptake of metal by "fouling organisms" was clearly shown in both Experiment I and II. This net uptake was replicated in Experiment I and II for Cd, Pb, and Zn. The uptake of copper by fouling organisms was only significant in Experiment I and for Ni and Cr in Experiment II. The fact that Ni and Cr didn't show a net uptake in Experiment I was probably due to a change in sample technique for fouling organisms initiated in Experiment II. In Experiment I, when a settling plate was sampled for fouling organisms, clean plates were added for the next sampling period, whereas, in Experiment II, a plate which was sampled at day 125 had remained in the system from day 0 to day 125. The fouling organisms sampled in Experiment II are, therefore, integrated samples over the sampling time. The net uptake by the fouling organisms of Cd, Pb, and Zn closely follows the loss of these same metals from the sewage sludge for both Experiment I and II. This same correlation, between fouling organisms and sludge, holds true for Cd and Ni uptake in Experiment II.

The net uptake by *Thalassia* leaves and urchin internal organs closely parallel each other for Cu, Cr, Pb, Ni and Zn in both Experiment I and II. Significant cadmium uptake by *Thalassia* leaves and urchin internal organs was seen only in Experiment II. Schroeder (1975), using radioactive ^{57}Co, ^{60}Co, ^{54}Mn and ^{65}Zn in sea water, showed that, in *Thalassia testudinum*, the rhizomes had the highest uptake followed by leaves, then roots. In both Experiments our results for *Thalassia*, show significant net uptake for Cu, Cr, Ni and Pb in roots. The net uptake was higher in Experiment I for Pb and Cu and higher in Experiment II for Ni and Cr. Cadmium and zinc had a net uptake in *Thalassia* roots only in Experiment II. This uptake of metals by the urchin and the close correlation between the urchin's uptake and the uptake in *Thalassia* leaves was not surprising as the urchins were voracious foragers on *Thalassia* leaves and epiphytes.

This was also shown in the field by Camp et al., (1973). The net uptake of some metals in leaves was closely coupled to the uptake in the roots of Thalassia. The results for Cd, Ni, and Cr in Experiment II indicate a translocation of these two metals from roots to leaves. The translocation of metal was also indicated for Zn in Experiment II from day 85, where the net uptake decreases in the roots with an increase in the leaves and vice versa at day 125. In general, the maximum net uptake in Thalassia leaves was slightly greater than the uptake in roots. This is in apparent contradiction of Schroeder's results (1975) where roots were found to have the greatest uptake. However, our root sample consisted of roots plus rhizomes and, as rhizomes showed the highest net uptake in Schroeder's paper (1975), the contradiction between our results and Schroeder's is cleared up.

The interpretation of the significant net uptake for mangrove roots indicates that only Ni and Zn in Experiment I show a near linear increase over time. In Experiment II, only Cr showed a linear response over time, whereas, Zn and Cu showed an increase in net uptake followed by attainment of apparent equilibrium, then loss of the metal. Lead shows no net uptake until day 85. These results appear to be loosely correlated with the fact that the sediment never showed a net uptake until at day 85 in Experiment II when Ni, Pb and Zn began to show a slight net uptake (Appendix B) in the sediment. Since no other part of the mangroves sampled indicated a significant uptake of metal (Appendix B), then the only source for the metals in the mangrove roots must be the sediments. If that is so, then only Ni, Pb and Zn should show net uptake in mangrove roots and then only after day 85 in Experiment II. This lack of significant uptake of metals by the sediments could be due to the pooling of whole sediment samples from a 2.5 cm diam. x 25 cm core. If the gradient of trace metal concentration in the sediment was very steep, then the pooling of the core could have diluted the higher surface metal concentrations with the much lower metal concentrations in the bottom of the core.

There were similarities in net uptake by holothurian guts for Experiments I and II. Although there are similar patterns of uptake in the holothurian gut, the maximum values for net uptake were always higher in Experiment I for Ni, Cu, Pb and Zn. Chromium showed a higher maximum net uptake in Experiment II for holothurian guts. In Experiment II, the sewage sludge showed a two stage release. The first stage occurred at day 1 followed by a slow constant release until day 50 when another rapid release occurred. A slow but steady release would more likely result in a higher maximum uptake, whereas, a two stage release, as shown by the sewage sludge in Experiment II would, due to the estimated 6 hour residence time for the water in the tanks and 8.5 ℓ min^{-1} flow rate, produce a lower maximum net uptake. The data for the net loss of metals from the sewage sludge was only available for two sampling times in Experiment I, so it is difficult to determine the true instantaneous net loss of metals from the sludge.

The original objectives for this research, as stated in the Introduction, have been obtained. A definite net uptake was found in members of a tropical marine community. These results were replicated at two different seasons and the results, considering the complexity of the system, agree quite well.

Originally, the fish, Diodon holacanthus (puffer) was to be added to the system. However, after collecting over 360 specimens we found that they were too sensitive to environmental factors other than sewage sludge and were easily killed. Therefore, fish were deleted from the ecosystem in order to expedite the completion of the experiment.

SECTION 5

CONCLUSIONS AND RECOMMENDATIONS

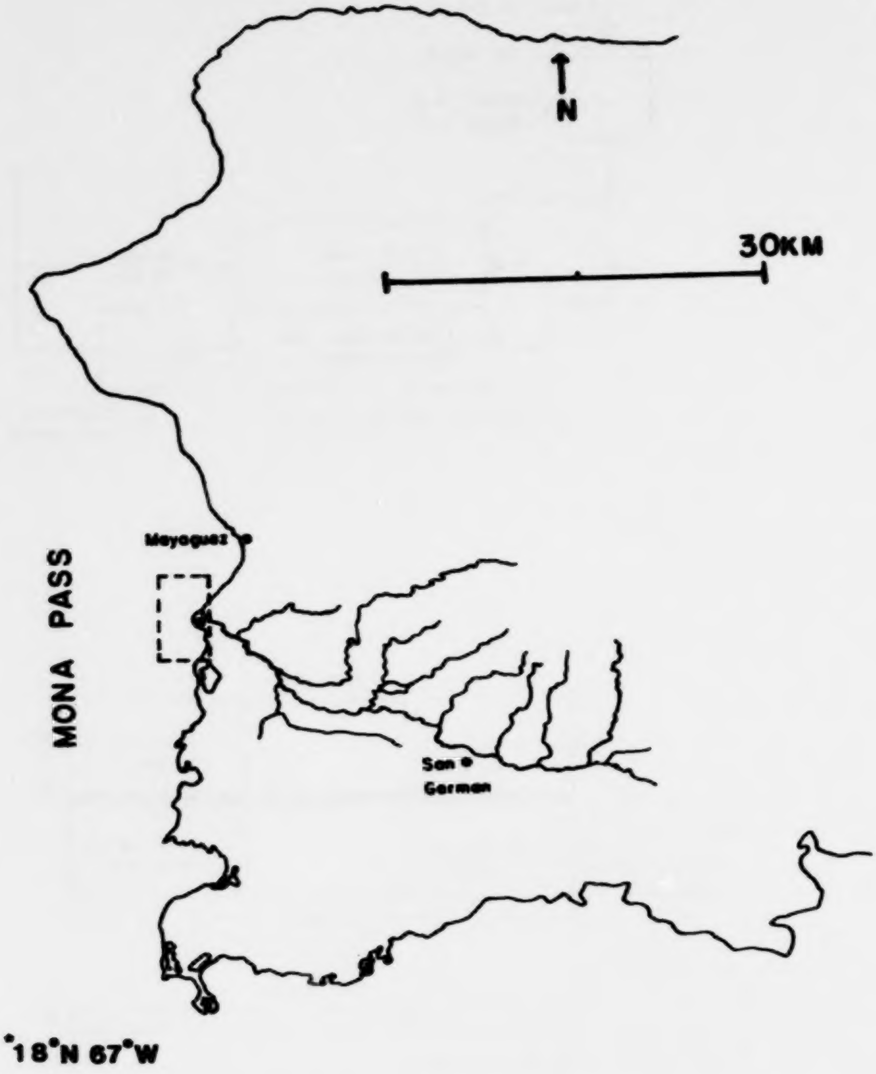
Net uptake of trace metals by members of a *Thalassia testudinum*/*Rhizophora mangle* community was demonstrated in two 125 day replicated experiments over the period from March 1975 to April 1976. The net uptake was especially significant in: *Thalassia testudinum* leaves and roots/rhizomes, internal organs of the urchin *Lytechinus variegatus*, "fouling organisms", internal organs of *Holothurea* sp., and for some metals in *Rhizophora mangle* roots. In general, the net uptake pathways followed the trophic levels in the food webs. This pathway was especially noticeable from the water to the fouling organisms and from the water to the *Thalassia testudinum* leaves and thence to the urchin herbivore *Lytechinus variegatus*. The net uptake in the *Holothurea* sp. was closely related to the net uptake in the fouling organisms and the trace metal loss rate of the sludge. The food web in this artificial system was dominated by the fouling organisms as would be expected. The uptake of trace metals, leached from the sludge, was always greatest in this complex group.

The results of long term exposure, in a simulated tropical ecosystem, to toxic trace metals more closely approximate the situation in nature than do laboratory experiments. In this respect we are in agreement with the statement by Phelps *et al.*, (1975) "Chronic exposures to elevated metal levels through the food web should be used as a more realistic test for possible deleterious effects from such metals as Cr". No artificial system can ever reproduce a natural ecosystem. However, it is more important to closely approximate the natural system with a system which can duplicate itself (Menzel, D.W. 1977). Our results show that chronic exposure to toxic metals can lead to uptake and concentration of these metals in marine organisms. We were able to duplicate our results using this complex simulation of a marine ecosystem.

More detailed work on the net uptake of toxic metals, using this complex simulated ecosystem, and the roles of the "fouling organisms" and plankton in this system is needed. This must involve integrated sampling of the organisms as well as the water. The advent of more precise methods of *direct* trace metal determination in sea water using anodic stripping voltammetry and non-flame atomic absorption spectrophotometry, in lieu of flame AAS, should allow a reasonable sample size for both organisms and water.

The authors would not recommend, based on the results of this research, the dumping of sewage sludge in shallow, tropical marine environments. The potential exists for rapid concentration of toxic trace metals by members of the food web high on the trophic scale. These toxic levels could then affect organisms used as food by man.

The next logical step in future research would be to add vertebrate organisms to this system to see if a herbivore, which normally consumes turtle grass, would show a net uptake of toxic trace metals.



30KM
N
Mayaguez
MONA PASS
San German
18°N 67°W

Figure 1. Study site location.

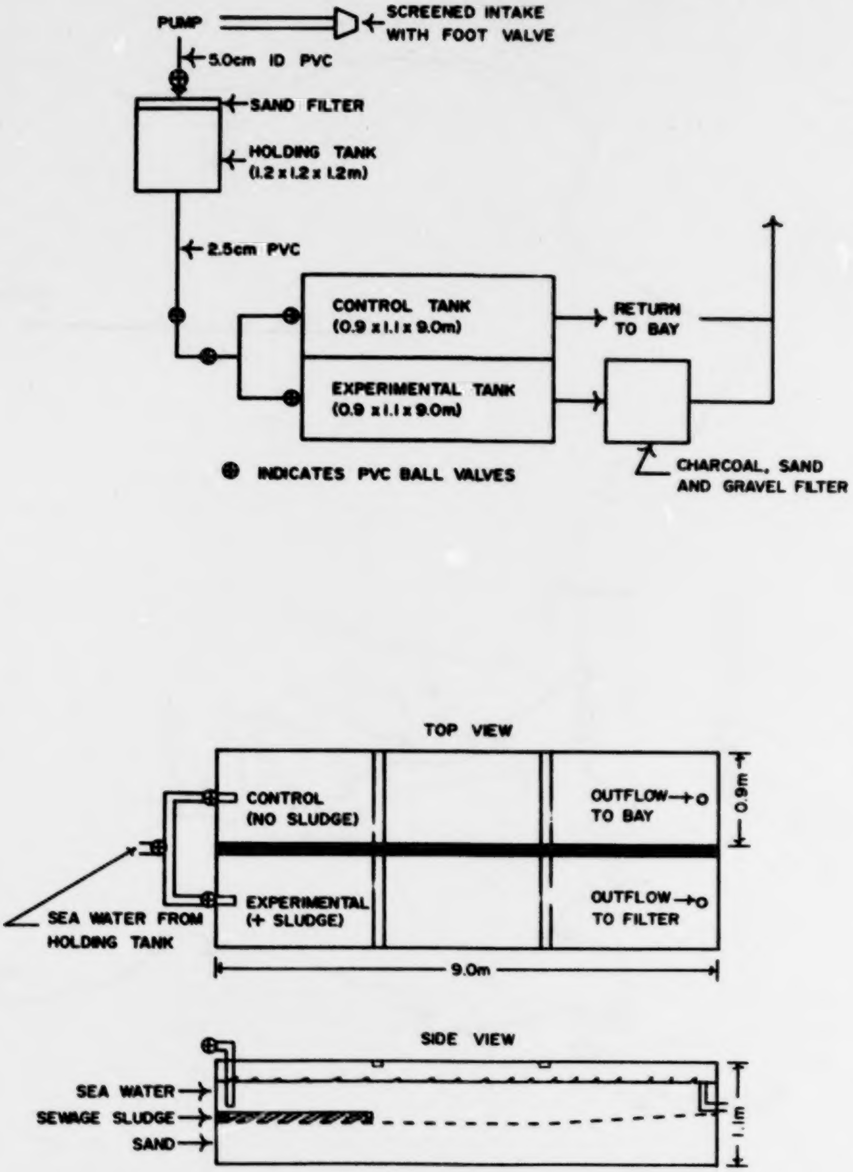
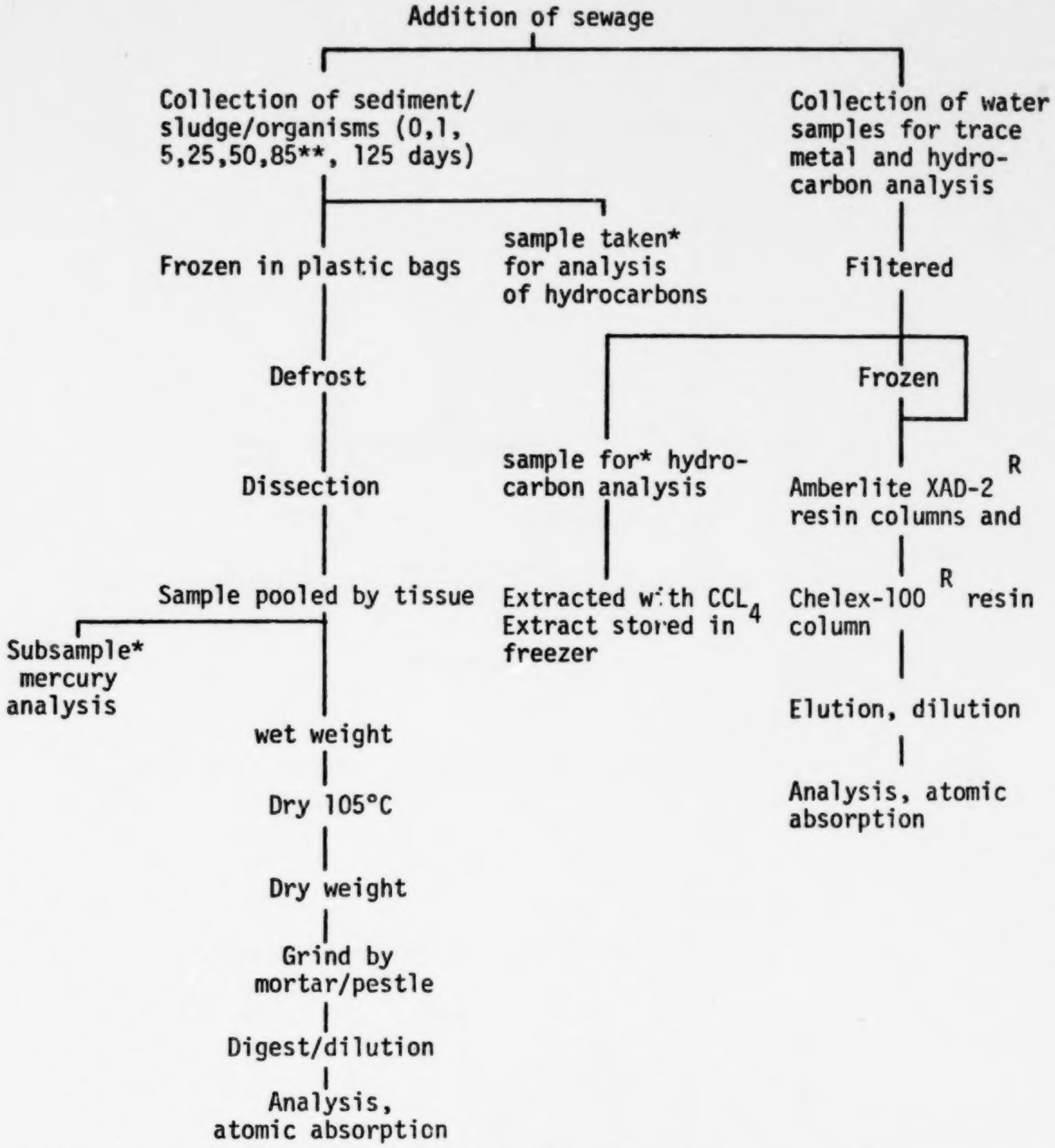

PUMP
SCREENED INTAKE WITH FOOT VALVE
5.0cm ID PVC
SAND FILTER
HOLDING TANK (1.2 x 1.2 x 1.2m)
2.5cm PVC
CONTROL TANK (0.9 x 1.1 x 9.0m)
EXPERIMENTAL TANK (0.9 x 1.1 x 9.0m)
RETURN TO BAY
CHARCOAL, SAND AND GRAVEL FILTER
⊕ INDICATES PVC BALL VALVES
TOP VIEW
CONTROL (NO SLUDGE)
EXPERIMENTAL (+ SLUDGE)
OUTFLOW → TO BAY
OUTFLOW → TO FILTER
SEA WATER FROM HOLDING TANK
0.9m
9.0m
SIDE VIEW
SEA WATER
SEWAGE SLUDGE
SAND
1.1m

Figure 2. Diagram of experimental design, tank configuration, and sea water system.


Addition of sewage
Collection of sediment/sludge/organisms (0,1, 5,25,50,85**, 125 days)
Collection of water samples for trace metal and hydrocarbon analysis
Frozen in plastic bags
sample taken* for analysis of hydrocarbons
Filtered
Defrost
Frozen
Dissection
sample for* hydrocarbon analysis
Amberlite XAD-2 R resin columns and
Sample pooled by tissue
Extracted with CCL4 Extract stored in freezer
Chelex-100 R resin column
Subsample* mercury analysis
Elution, dilution
wet weight
Analysis, atomic absorption
Dry 105°C
Dry weight
Grind by mortar/pestle
Digest/dilution
Analysis, atomic absorption

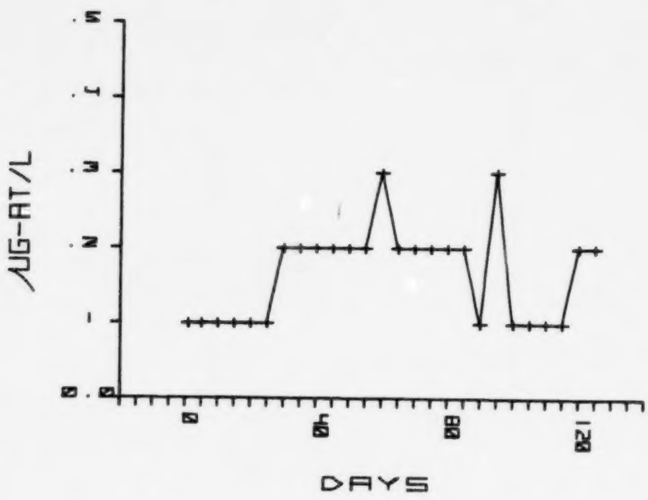
Samples were collected at 0,1,5,25,50,85** and 125 days after addition of sewage sludge.

*Samples for mercury, and hydrocarbons in both water, sediment, sludge and organisms were stored frozen for future analyses.

**An additional sampling was made for Experiment II, Day 0 refers to the sample taken before addition of sewage sludge.

Figure 3. Flow chart of trace metal and hydrocarbon sampling from collection processing into final sample form.

DRP/ CONTROL EXP. 1



DRP/ CONTROL EXP. 2

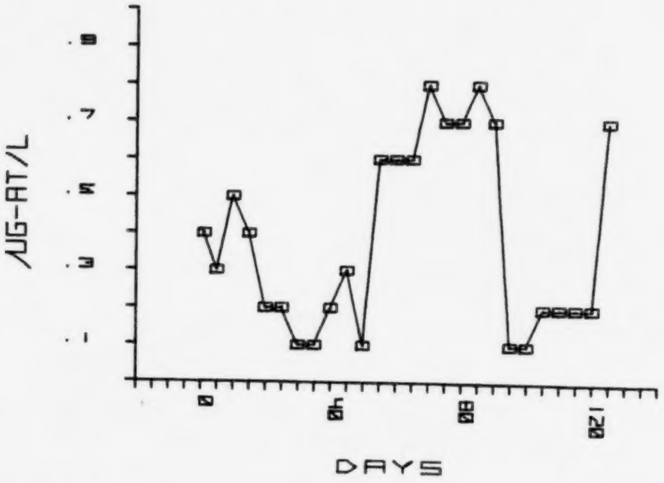


Figure 4. Dissolved reactive phosphate concentration of Experiment I and II, control. Data points are mean values for 5 day period, excluding day 1.

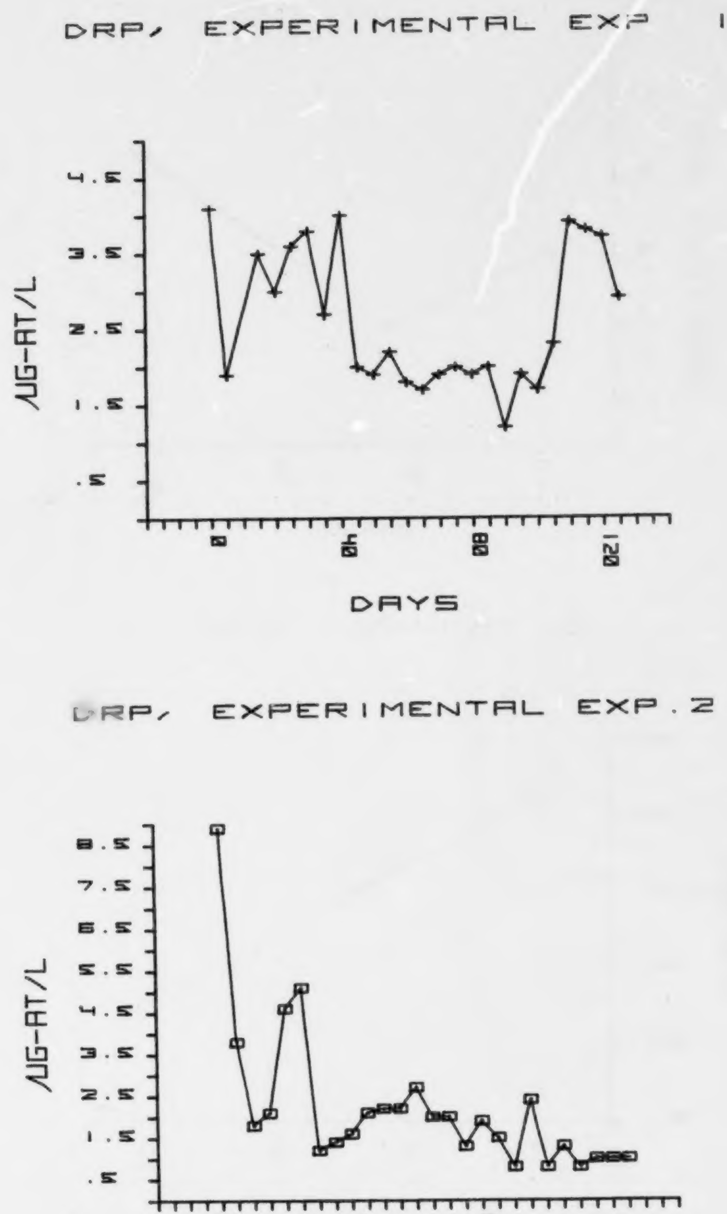
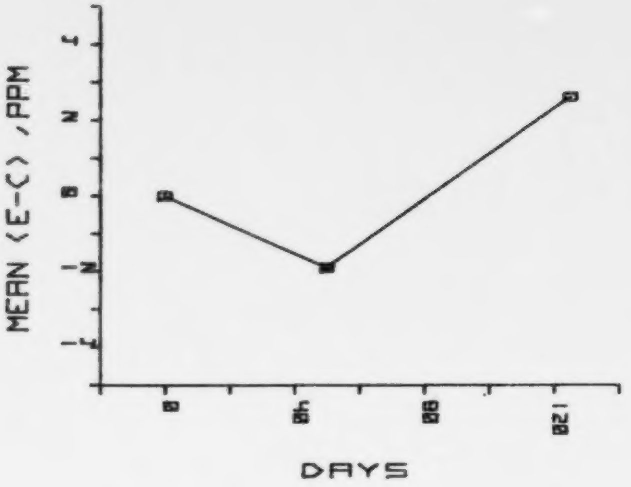


Figure 5. Dissolved reactive phosphate concentration Experiment I and II, experimental. Data points are mean values for 5 day period, excluding day 1.

CD FOULING ORGANISMS- EXP. 1



CD SEWAGE- EXP. 1

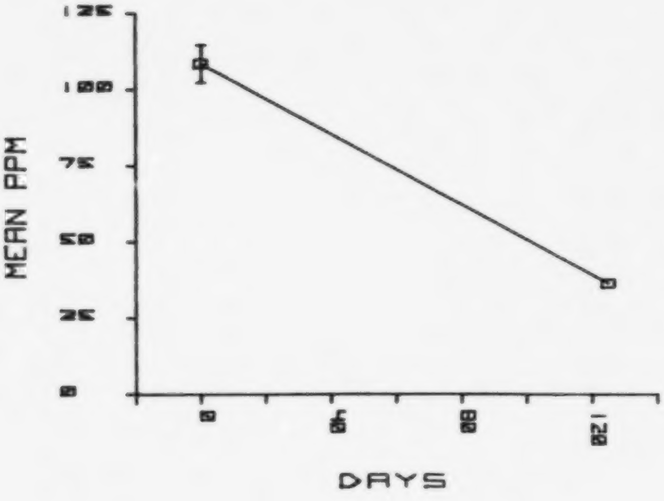
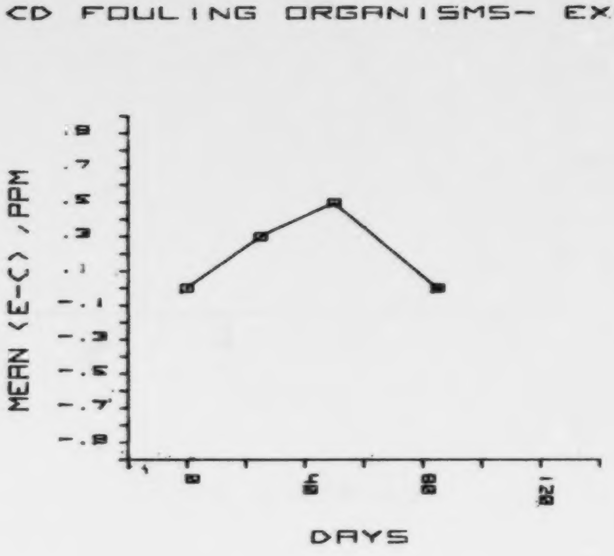


Figure 6. Mean net uptake of Cd between experimental and control, fouling organisms and sewage - Experiment I.


CD FOULING ORGANISMS- EXP. 2

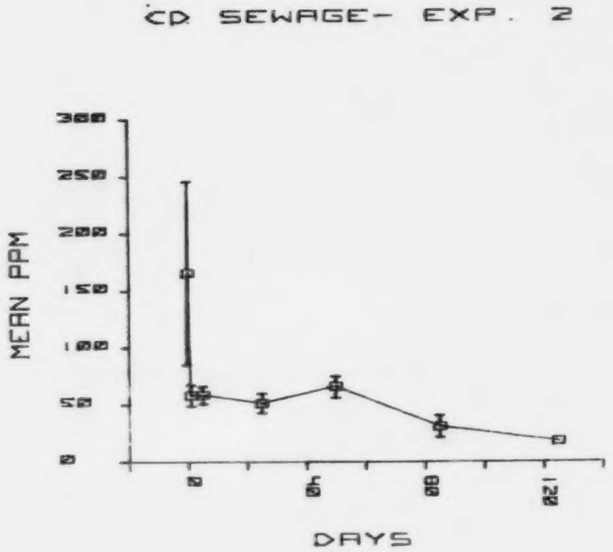

CD SEWAGE- EXP. 2

Figure 7. **Mean net uptake of Cd between experimental and control, fouling organisms and sewage - Experiment II.**

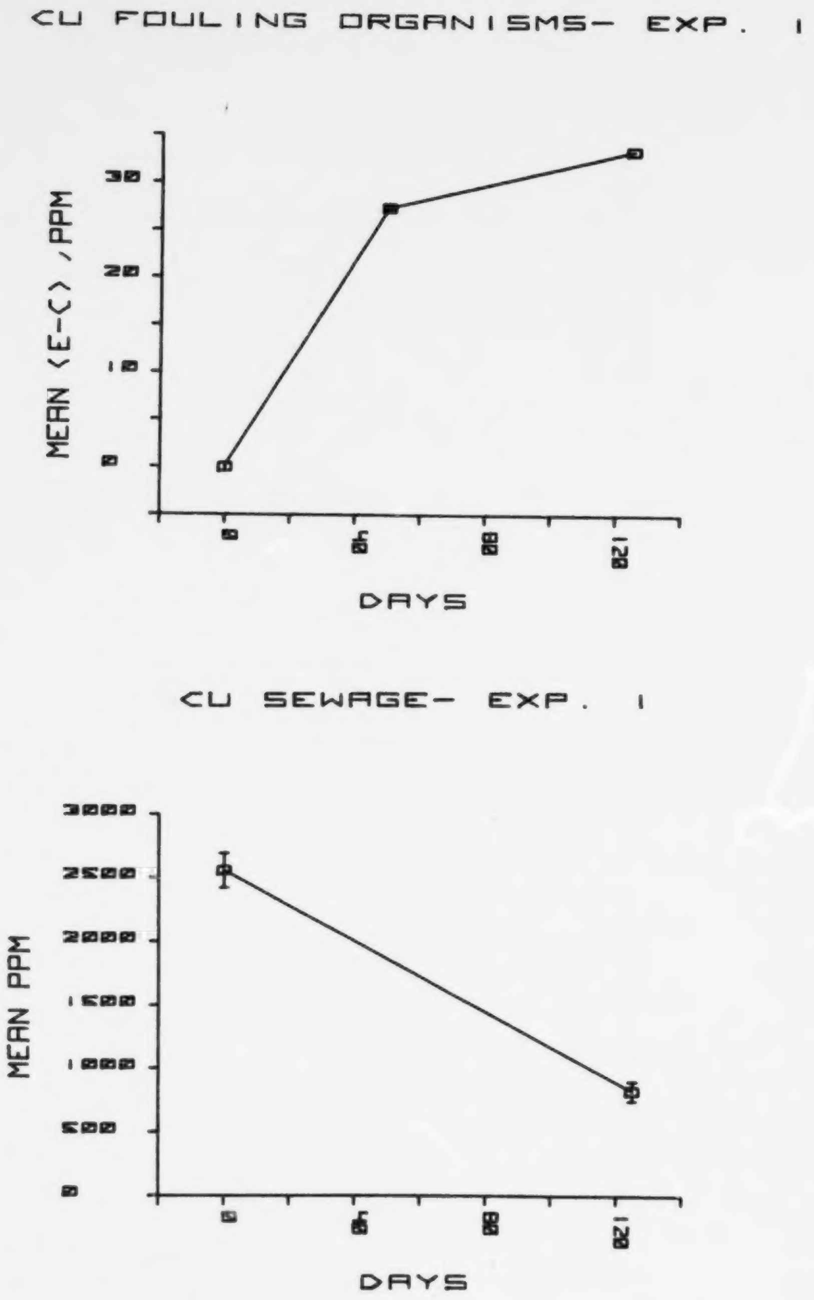
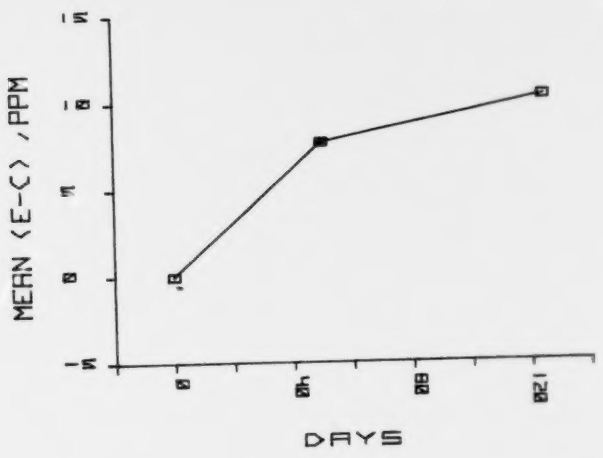
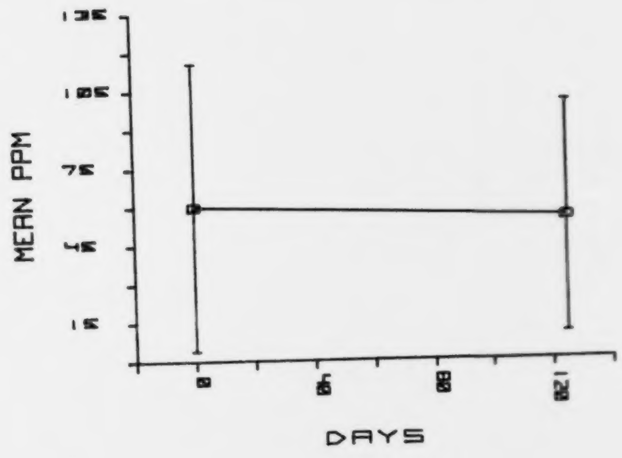


Figure 8. Mean net uptake of Cu between experimental and control, fouling organisms and sewage - Experiment I.



PB FOULING ORGANISMS- EXP. 1



PB SEWAGE- EXP. 1

Figure 9. Mean net uptake of Pb between experimental and control, fouling organisms and sewage - Experiment I.

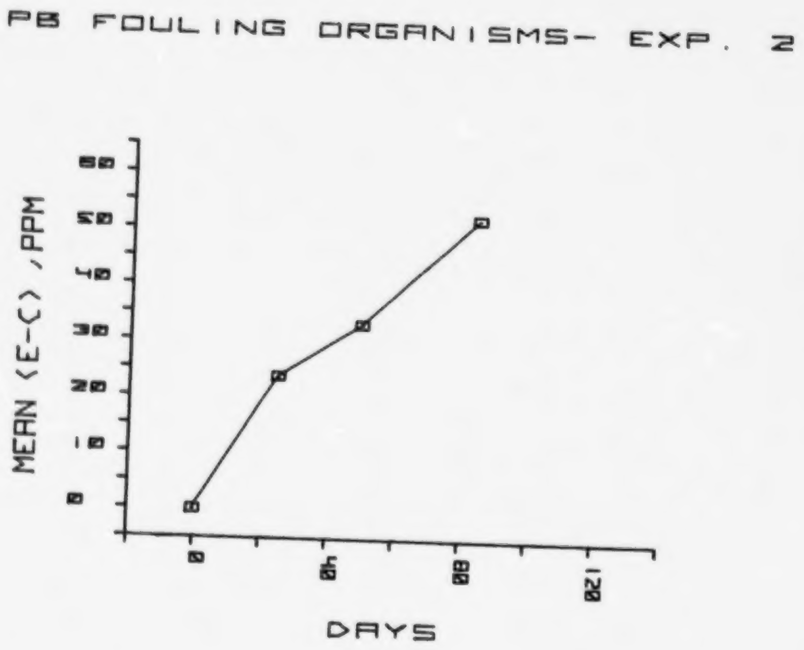


Figure 10. Mean net uptake of Pb between experimental and control, fouling organisms - Experiment II.

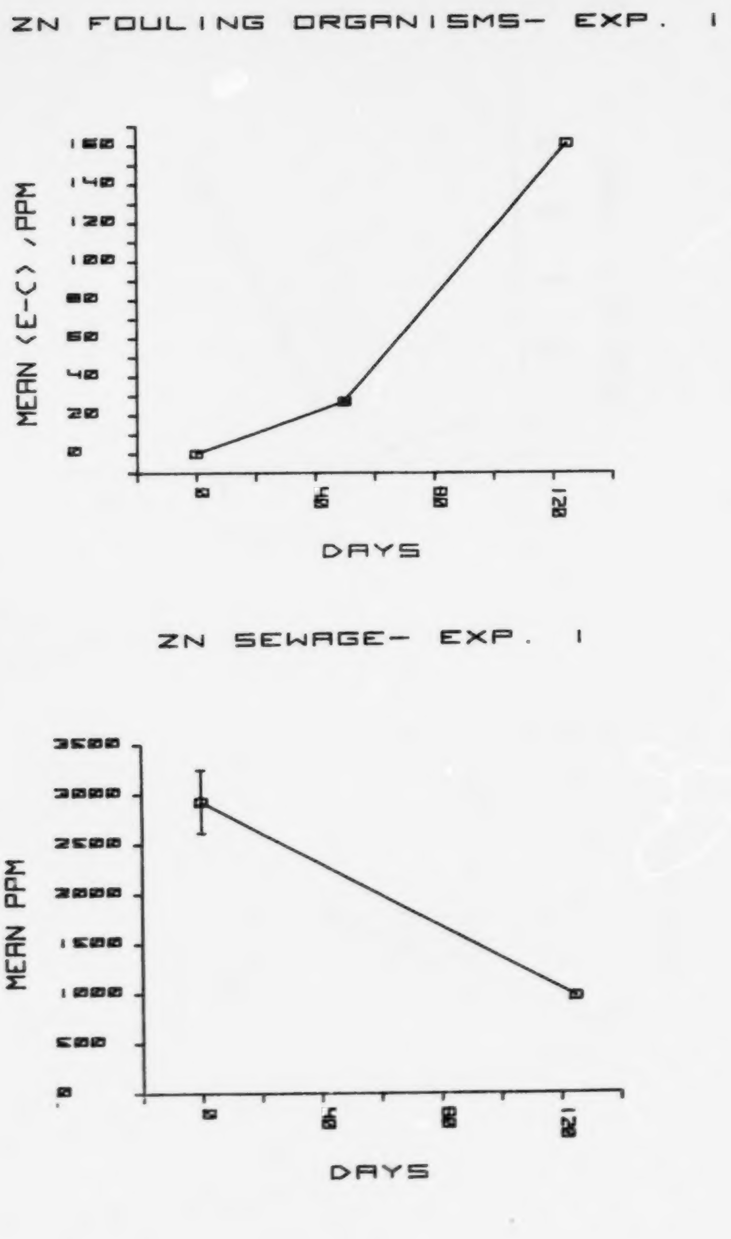


Figure 11. Mean net uptake of Zn between experimental and control, fouling organisms and sewage - Experiment I.

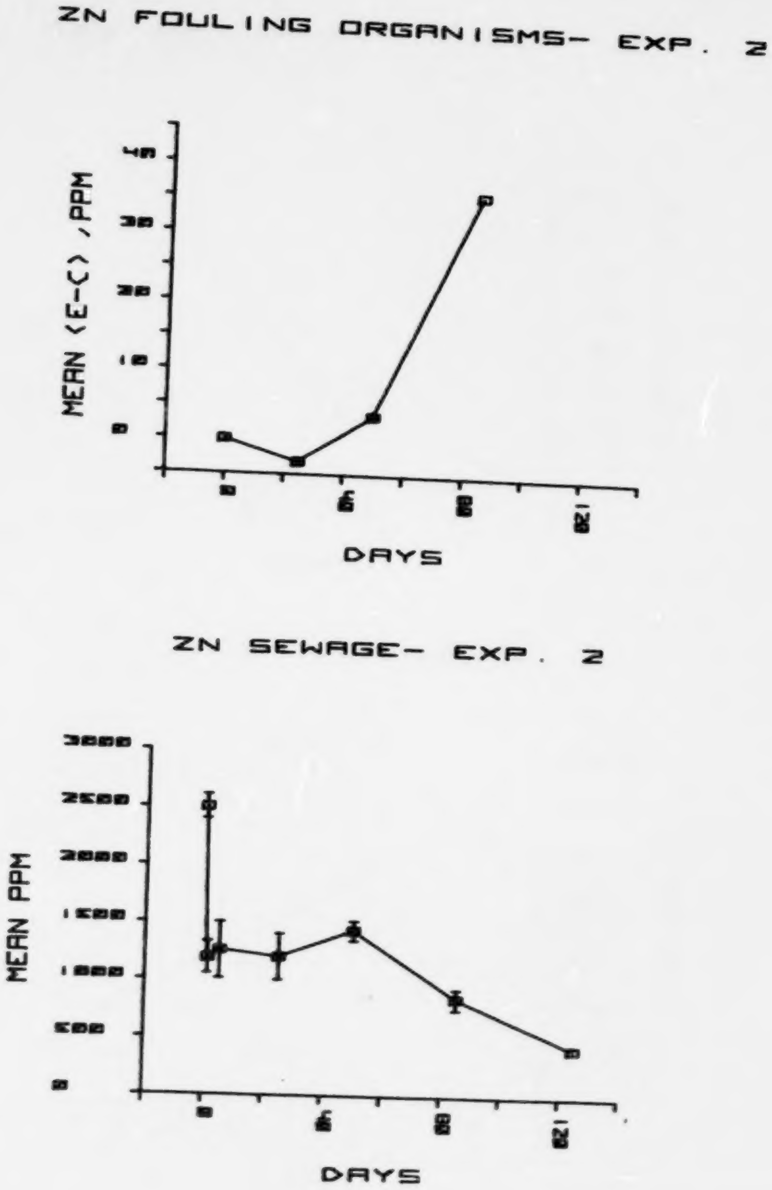


Figure 12. Mean net uptake of Zn between experimental and control, fouling organisms and sewage - Experiment II.

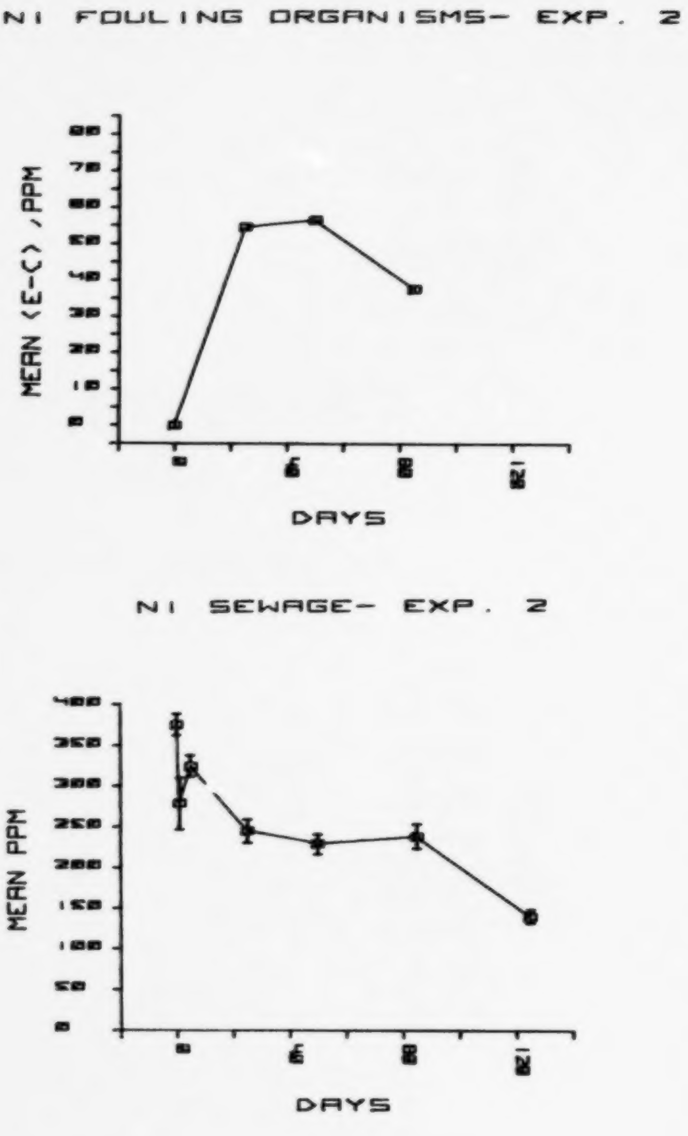


Figure 13. Mean net uptake of Ni between experimental and control, fouling organisms and sewage - Experiment II.

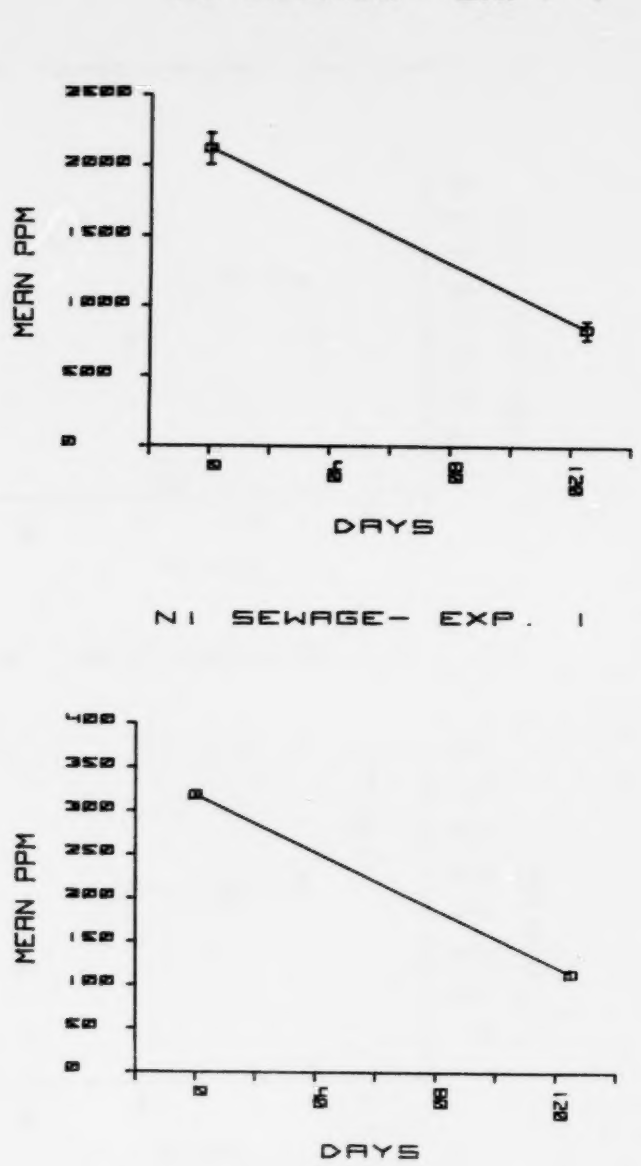


Figure 14. Mean net uptake of Cr and Ni between experimental and control, sewage - Experiment I.

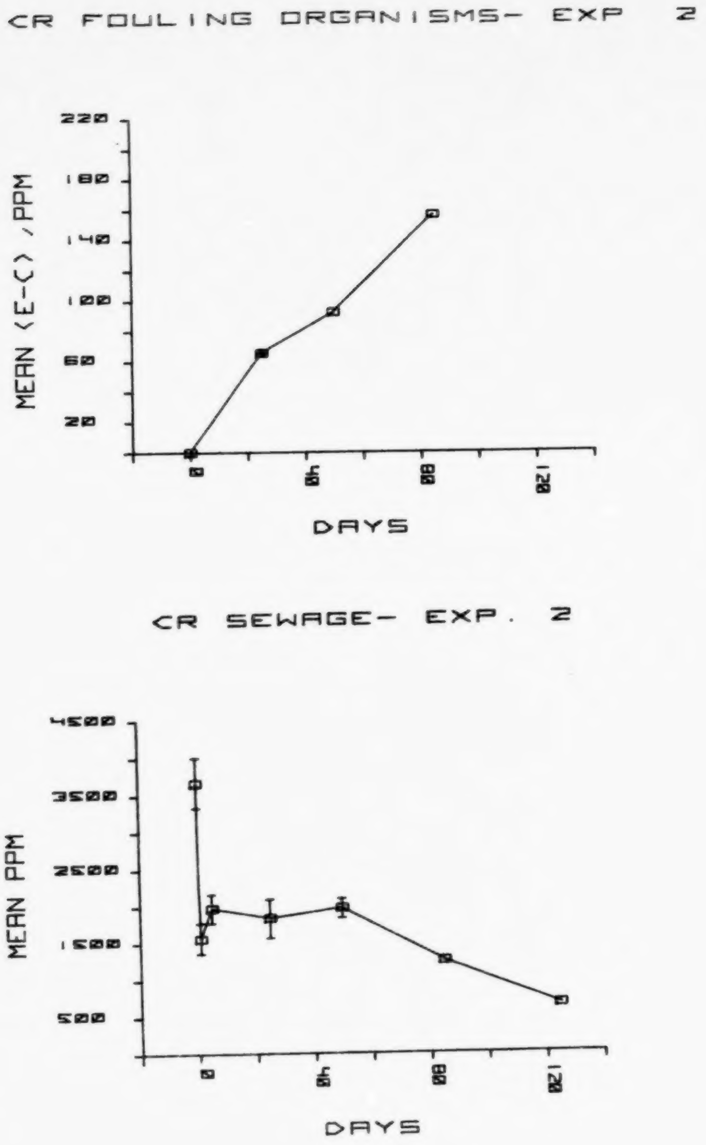
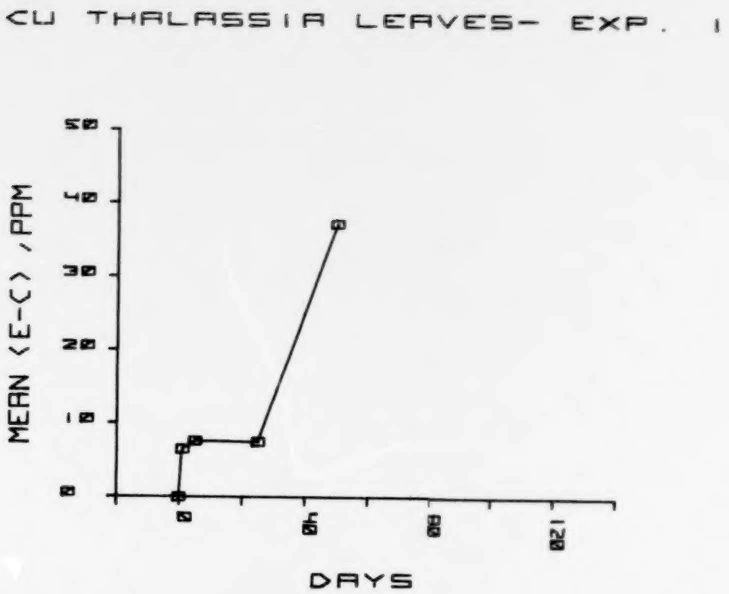
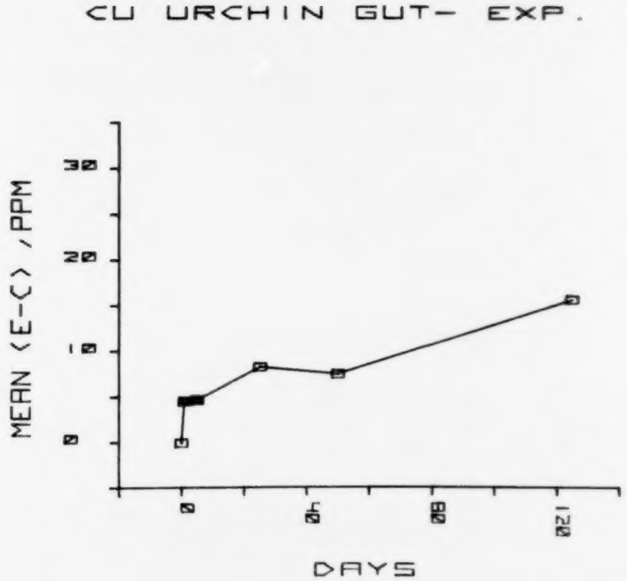


Figure 15. Mean net uptake of Cr between experimental and control, fouling organisms and sewage - Experiment II.

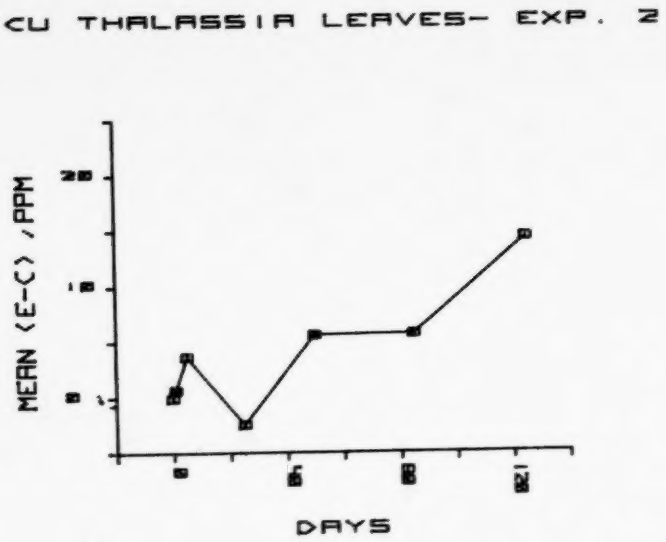


CU THALASSIA LEAVES- EXP. 1

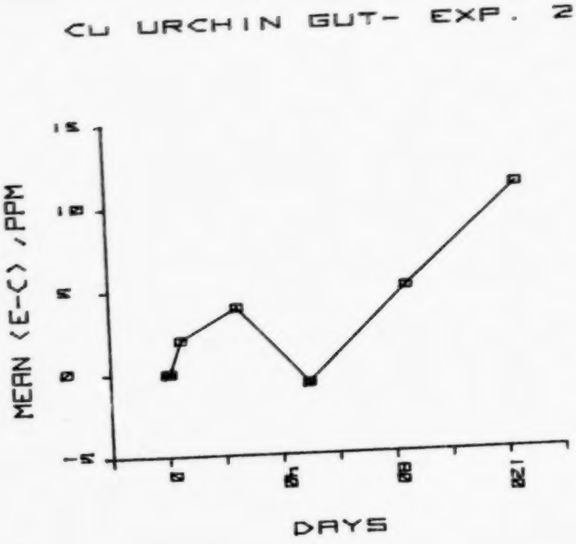


CU URCHIN GUT- EXP. 1

Figure 16. Mean net uptake of Cu between experimental and control, Thalassia leaves and urchin guts - Experiment I.

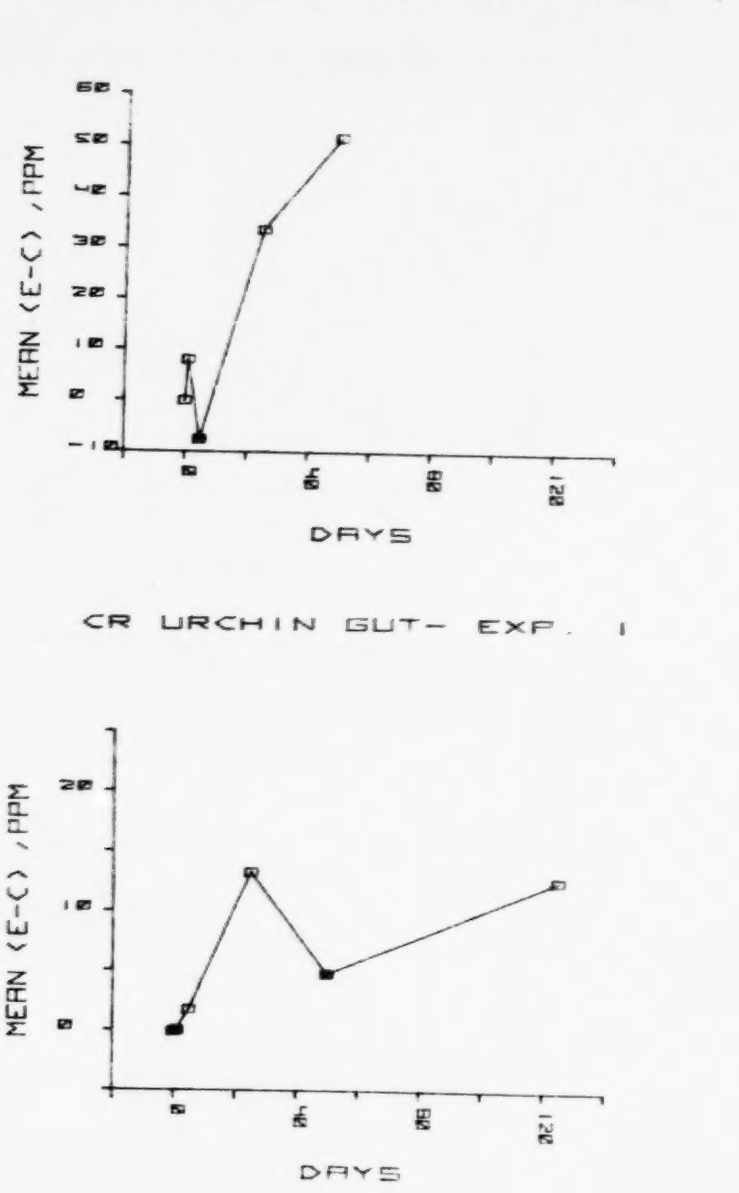


CU THALASSIA LEAVES- EXP. 2



CU URCHIN GUT- EXP. 2

Figure 17. Mean net uptake of Cu between experimental and control, *Thalassia* leaves and urchin guts - Experiment II.



CR THALASSIA LEAVES- EXP. 1

CR URCHIN GUT- EXP. 1

Figure 18. Mean net uptake of Cr between experimental and control, *Thalassia* leaves and urchin guts - Experiment I.

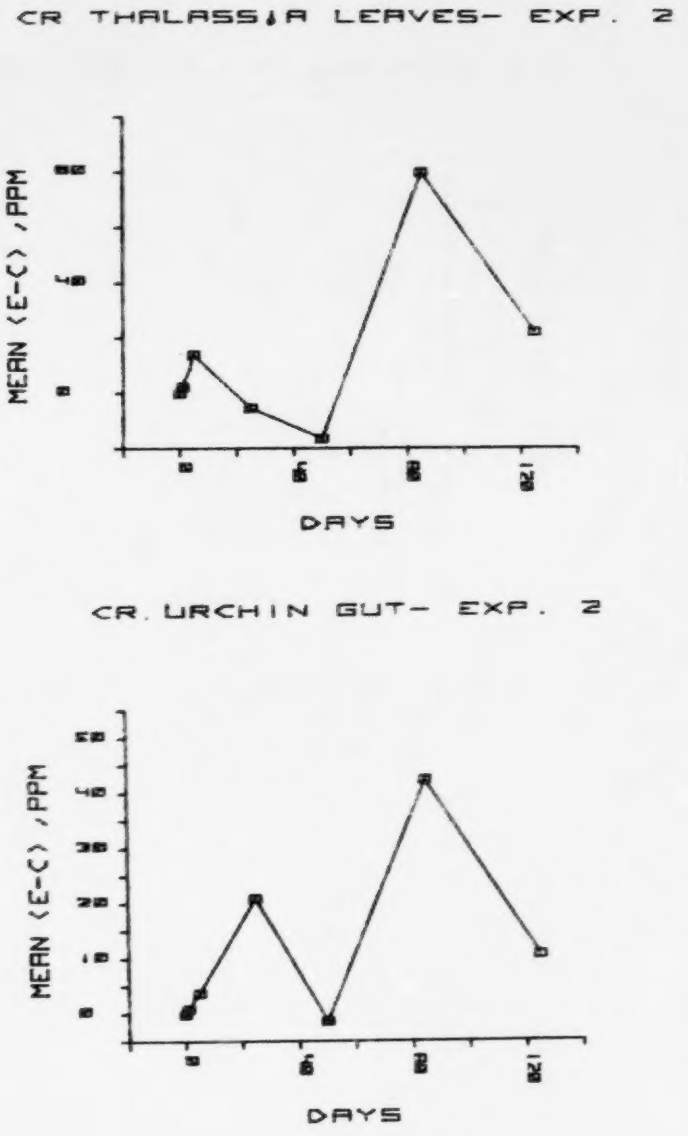
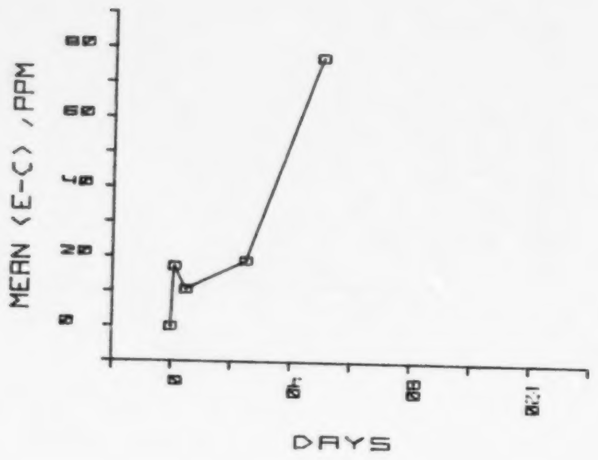
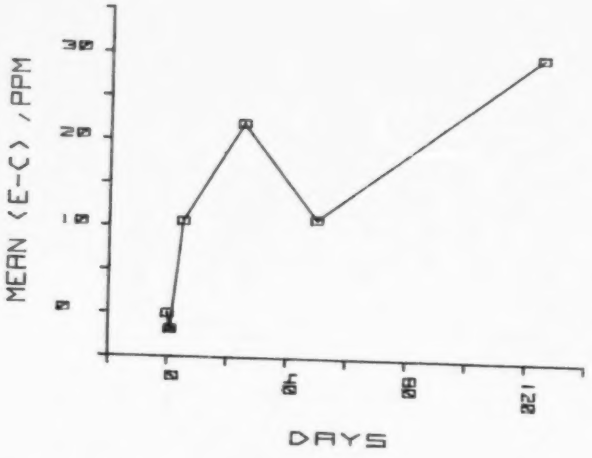


Figure 19. Mean net uptake of Cr between experimental and control, *Thalassia* leaves and urchin guts - Experiment II.

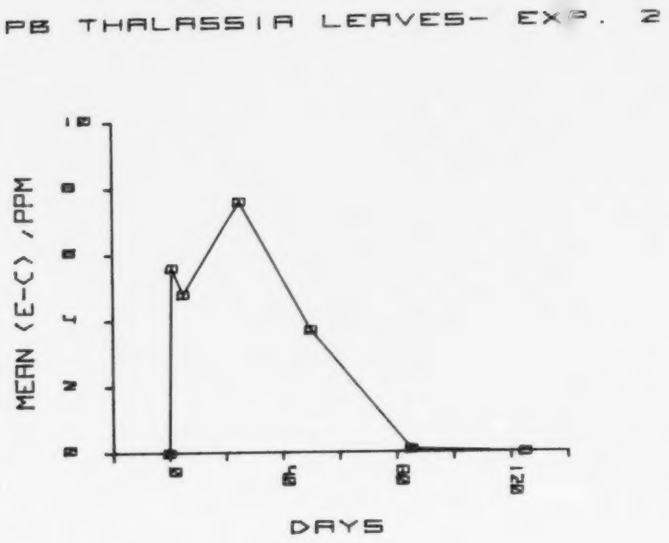


PB THALASSIA LEAVES- EXP. 1



PB URCHIN GUT- EXP. 1

Figure 20. Mean net uptake of Pb between experimental and control, *Thalassia* leaves and urchin guts - Experiment I.



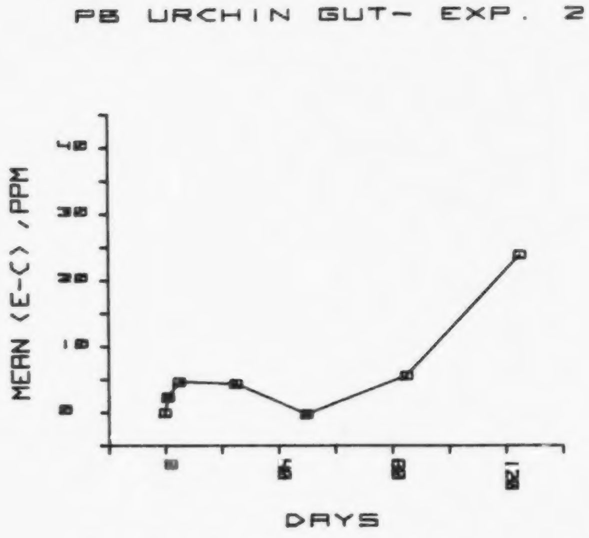


Figure 21. Mean net uptake of Pb between experimental and control, *Thalassia* leaves and urchin guts - Experiment II.

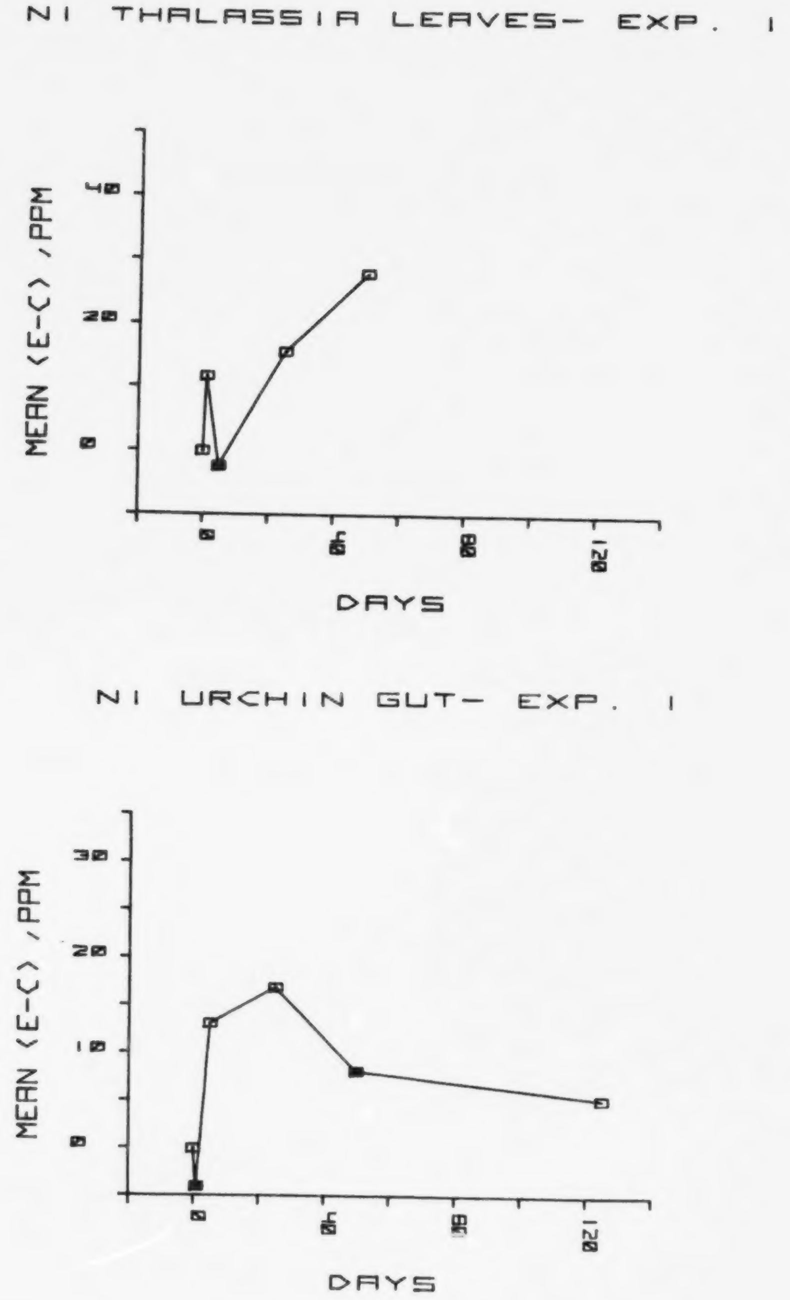
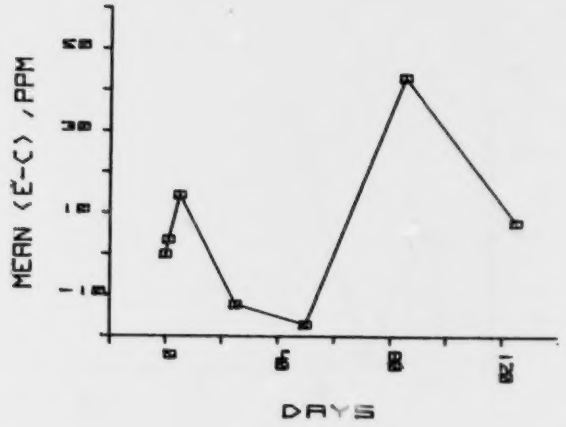


Figure 22. Mean net uptake of Ni between experimental and control, *Thalassia* leaves and urchin guts - Experiment I.

NI THALASSIA LEAVES- EXP. 2



NI URCHIN GUT- EXP 2

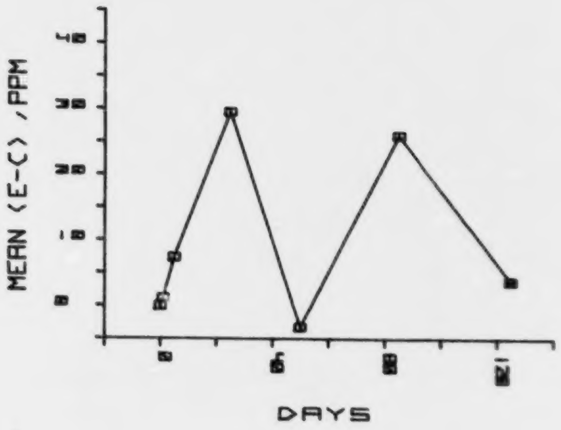


Figure 23. Mean net uptake of Ni between experimental and control, Thalassia leaves and urchin guts - Experiment II.

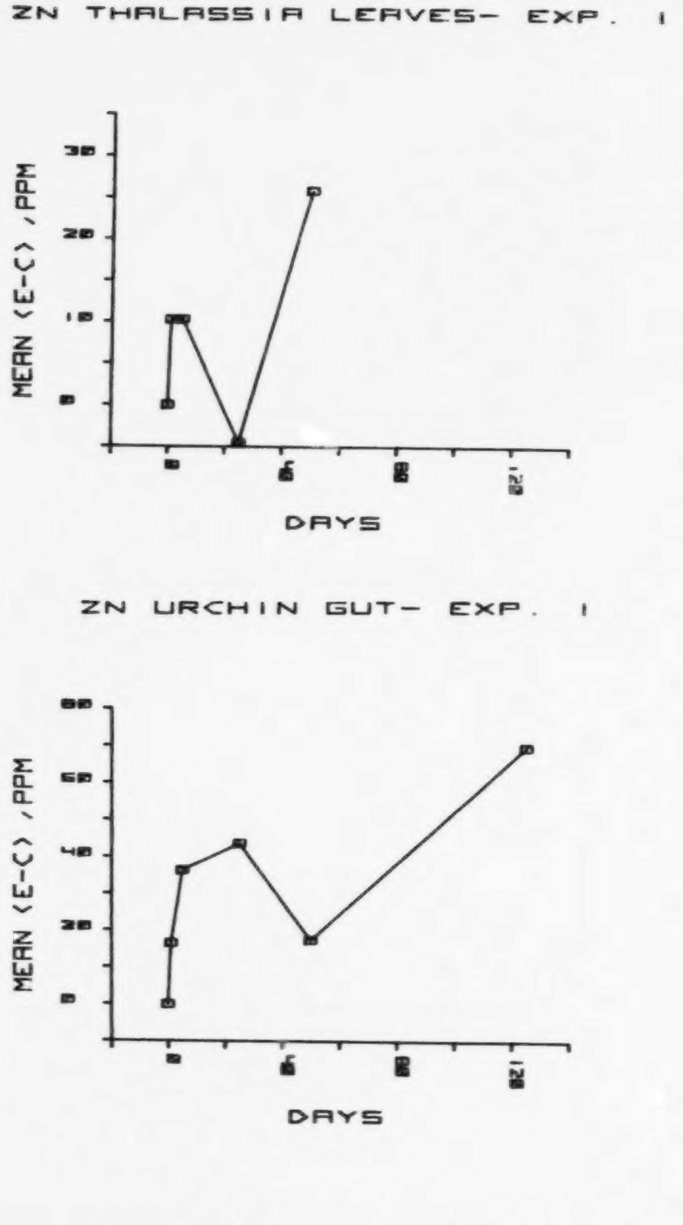
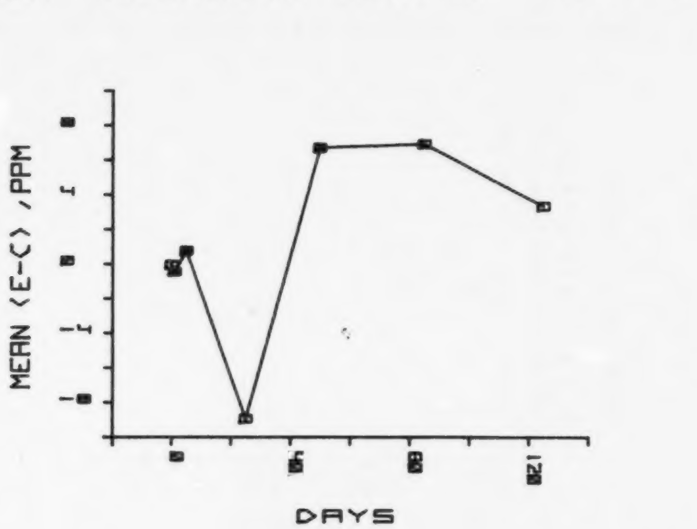


Figure 24. Mean net uptake of Zn between experimental and control, Thalassia leaves and urchin guts - Experiment I.



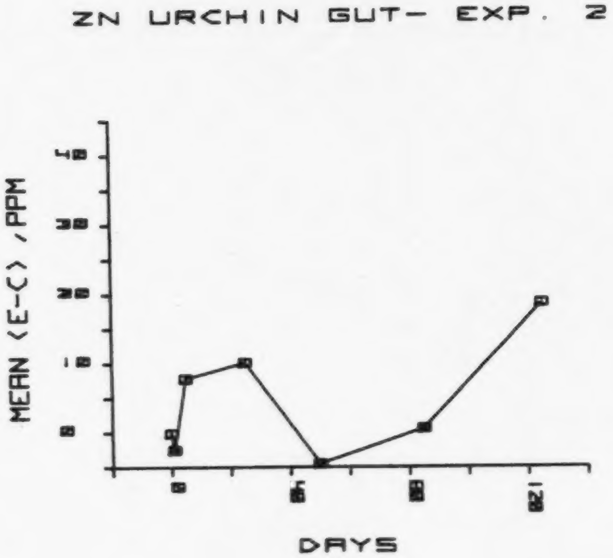
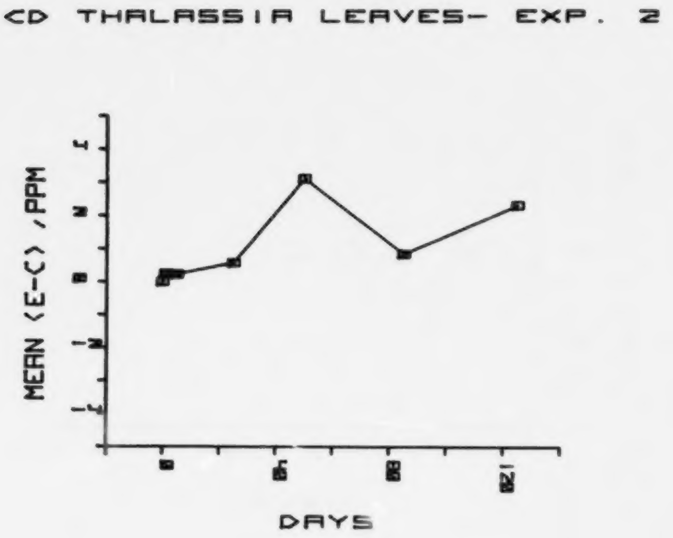


Figure 25. Mean net uptake of Zn between experimental and control, *Thalassia* leaves and urchin guts - Experiment II.


CD THALASSIA LEAVES- EXP. 2

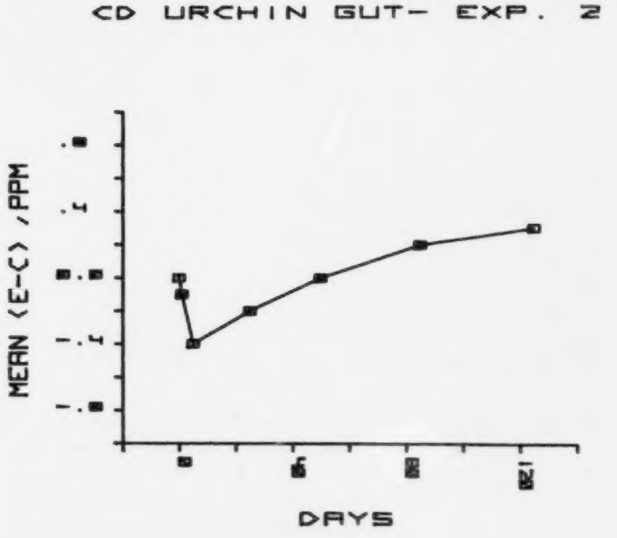

CD URCHIN GUT- EXP. 2

Figure 26. Mean net uptake of Cd between experimental and control, *Thalassia* leaves and urchin huts - Experiment II.

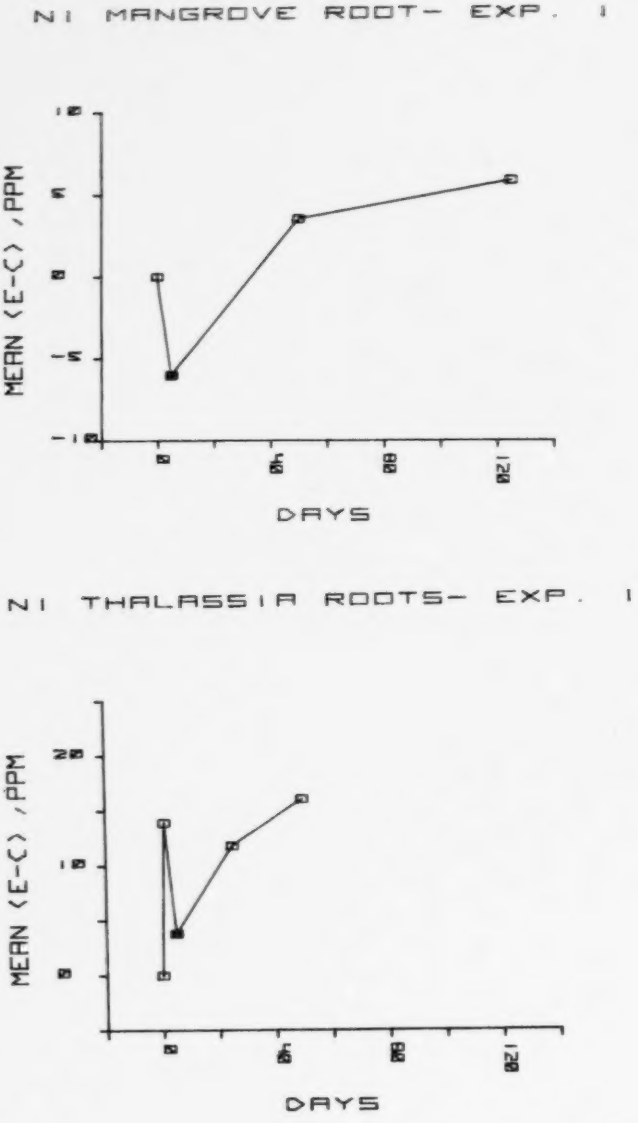


Figure 27. Mean net uptake of Ni between experimental and control, *Thalassia* roots and mangrove roots - Experiment I.

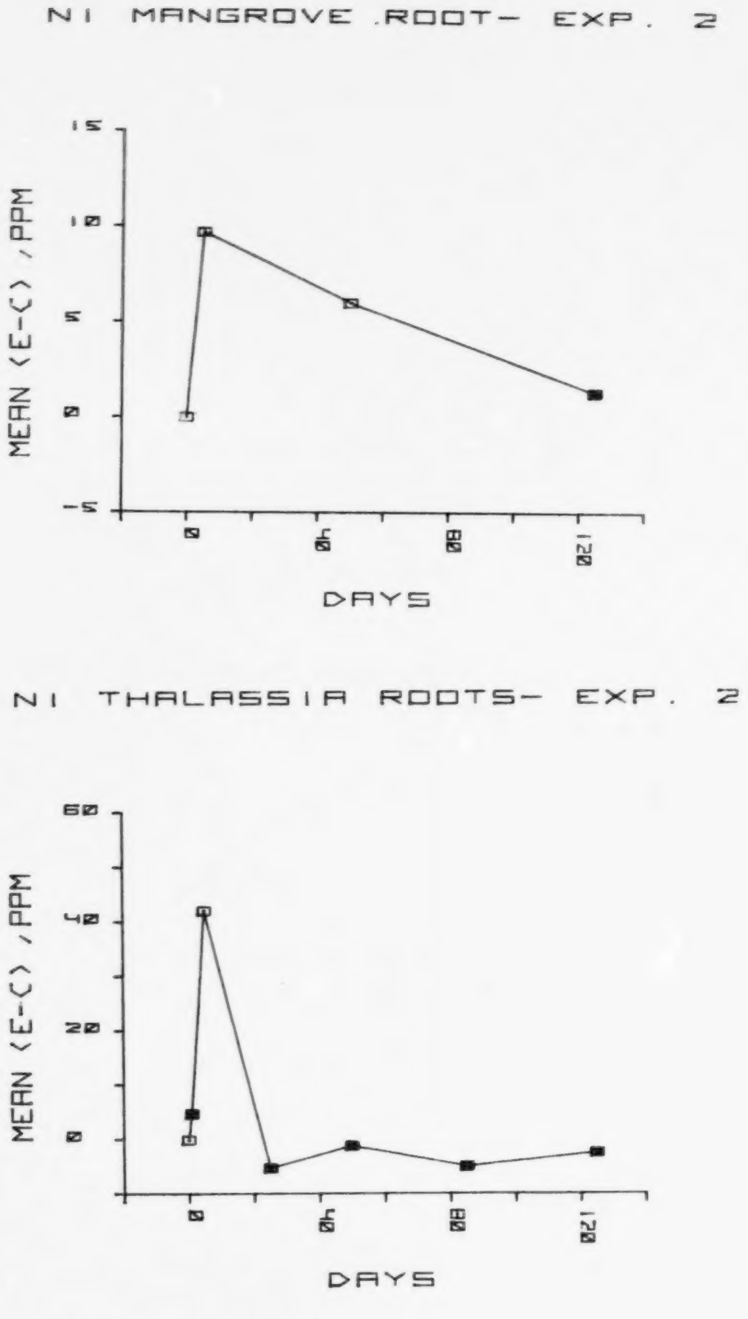


Figure 28. Mean net uptake of Ni between experimental and control, Thalassia roots and mangrove roots - Experiment II.

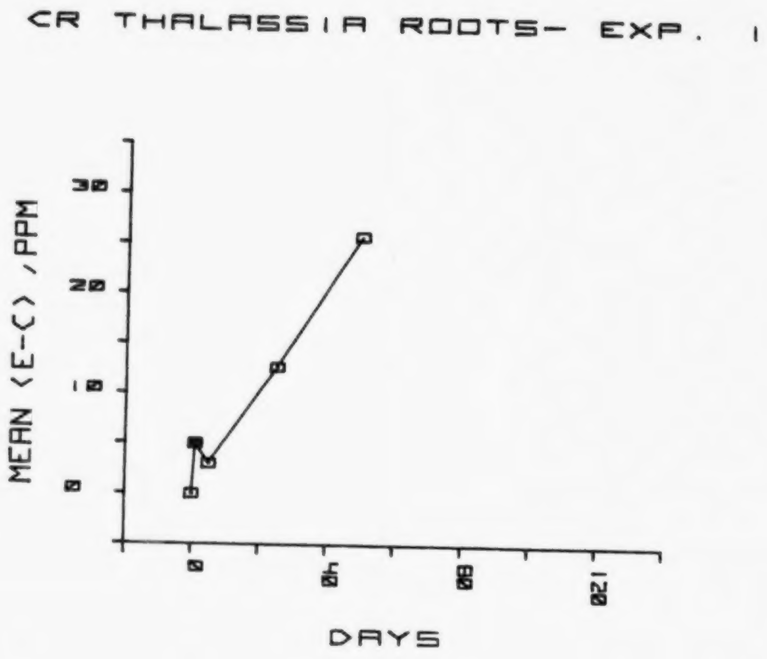
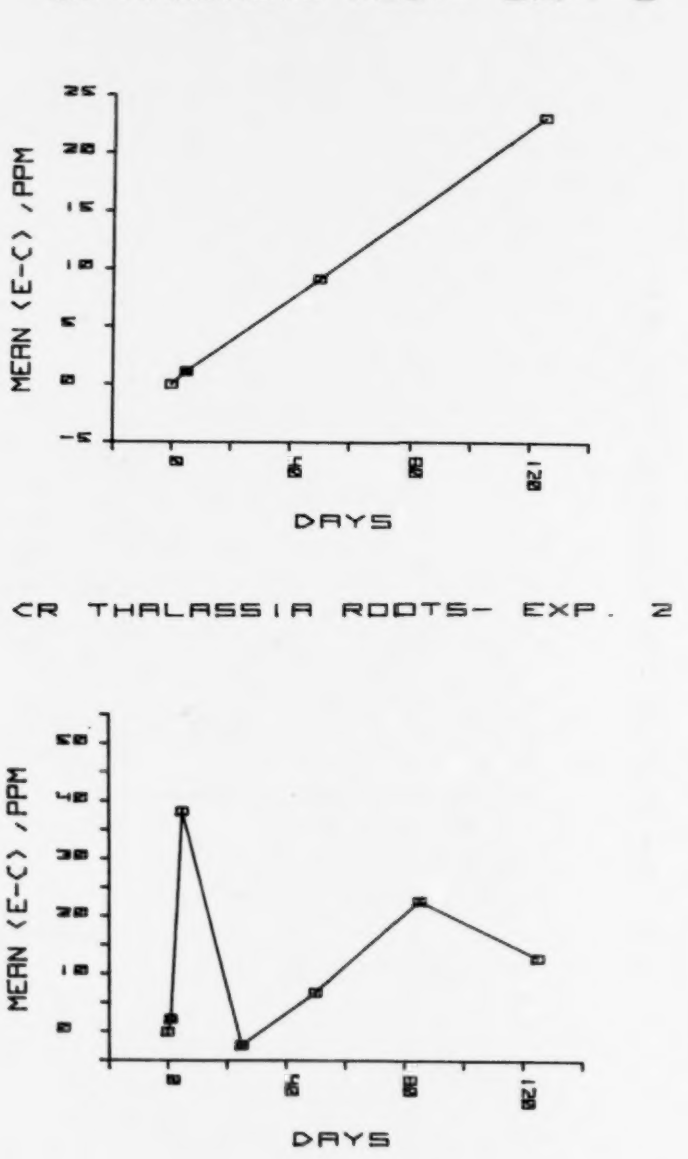


Figure 29. Mean net uptake of Cr between experimental and control, Thalassia roots - Experiment I.


CR MANGROVE ROOT– EXP. 2

CR THALASSIA ROOTS– EXP. 2

Figure 30. Mean net uptake of Cr between experimental and control, *Thalassia* roots and mangrove roots - Experiment II.

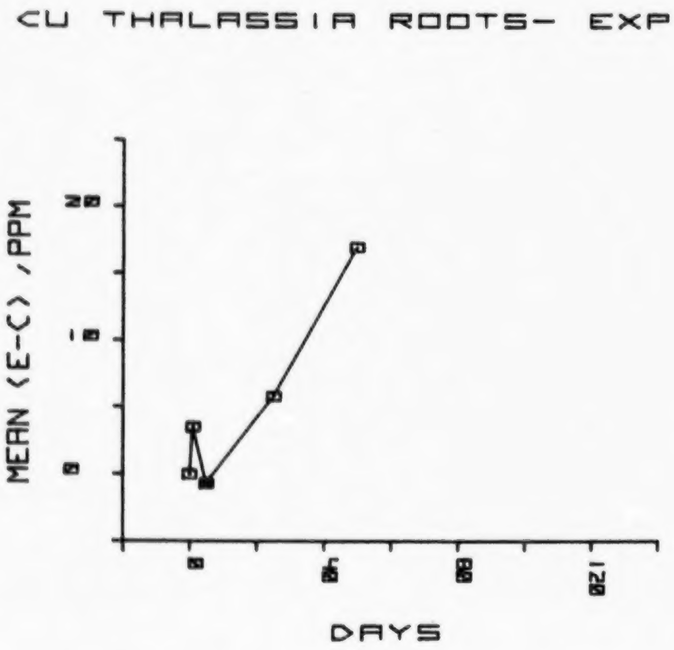
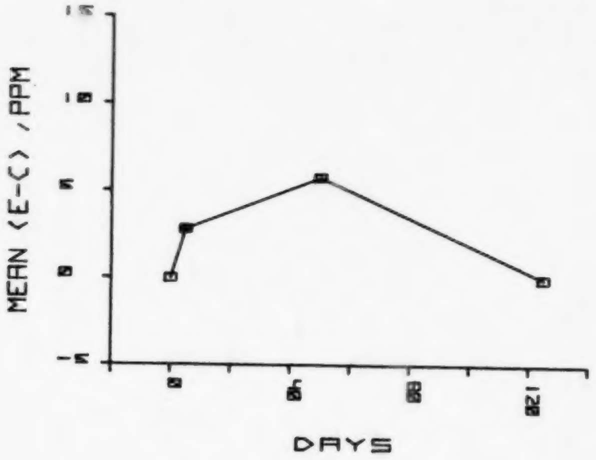
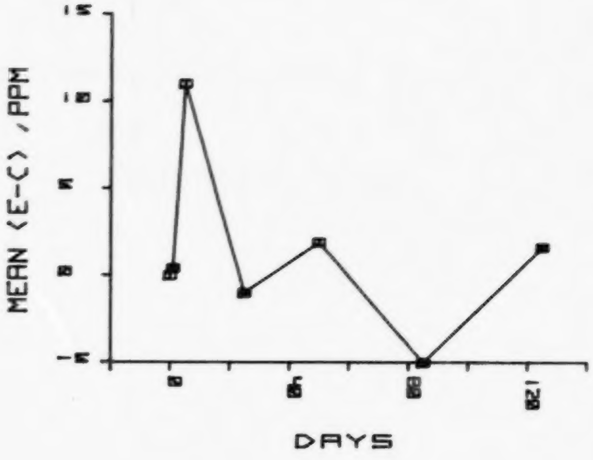


Figure 31. Mean net uptake of Cu between experimental and control, _Thalassia_ roots - Experiment I.



CU MANGROVE ROOT- EXP. 2



CU THALASSIA ROOTS- EXP. 2

Figure 32. Mean net uptake of Cu between experimental and control, *Thalassia* roots and mangrove roots - Experiment II.

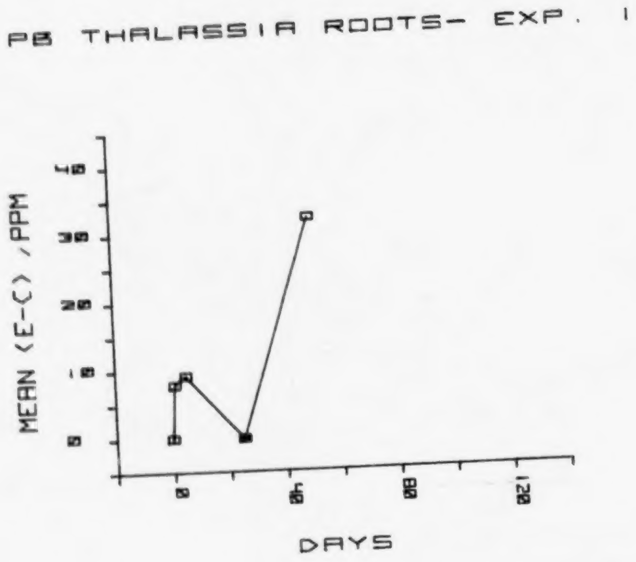
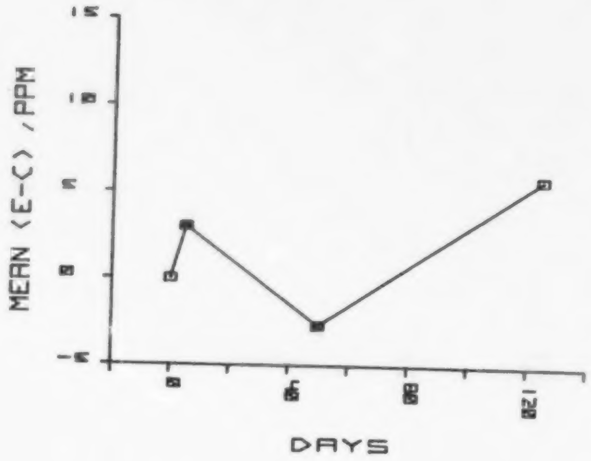


Figure 33. Mean net uptake of Pb between experimental and control, Thalassia roots - Experiment I.


PB MANGROVE ROOT- EXP. 2

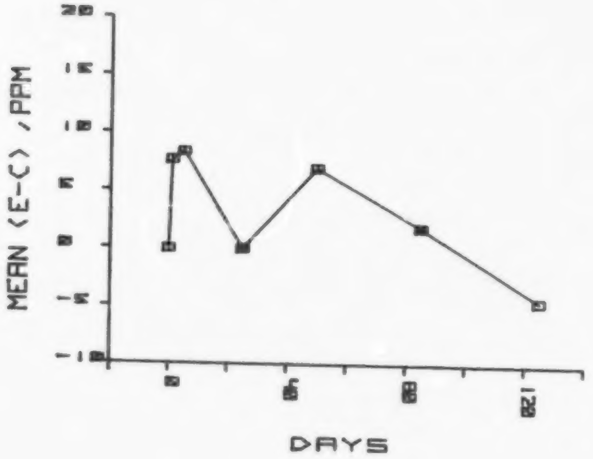

PB THALASSIA ROOTS- EXP. 2

Figure 34. Mean net uptake of Pb between experimental and control, *Thalassia* roots and mangrove roots - Experiment II.

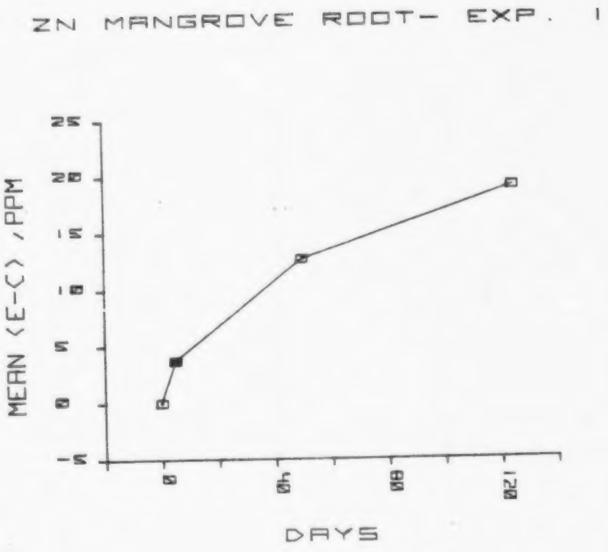
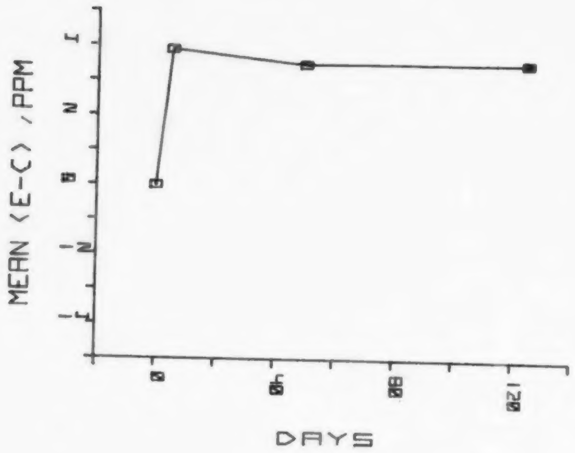


Figure 35. Mean net uptake of Zn between experimental and control, mangrove roots - Experiment I.


ZN MANGROVE ROOT- EXP. 2

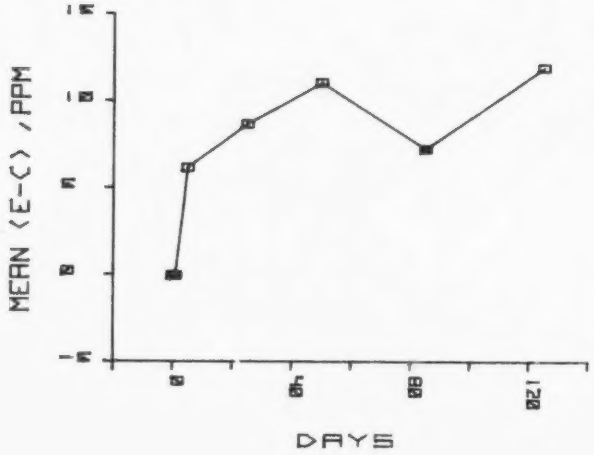

ZN THALASSIA ROOTS- EXP. 2

Figure 36. Mean net uptake of Zn between experimental and control, *Thalassia* roots and mangrove roots - Experiment II.

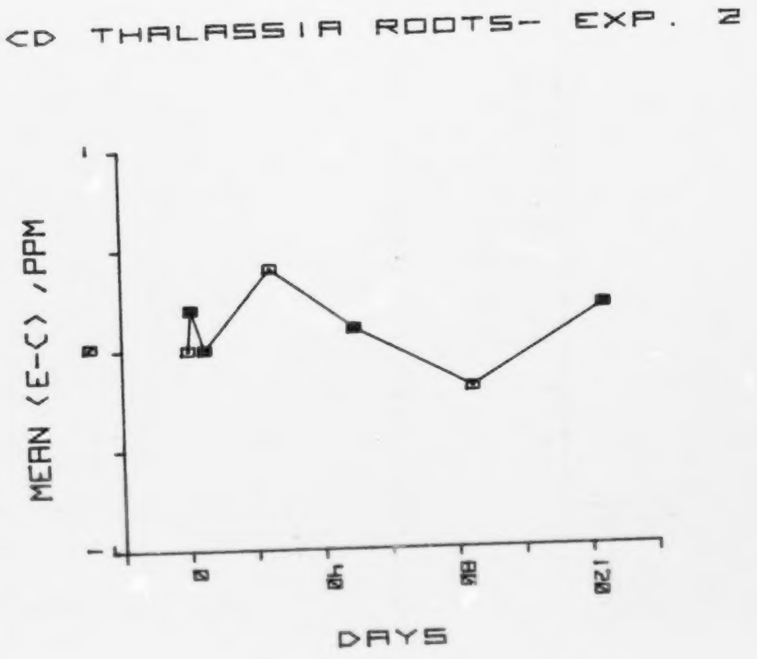


Figure Mean net uptake of Cd between experimental and control, Thalassia roots - Experiment II.

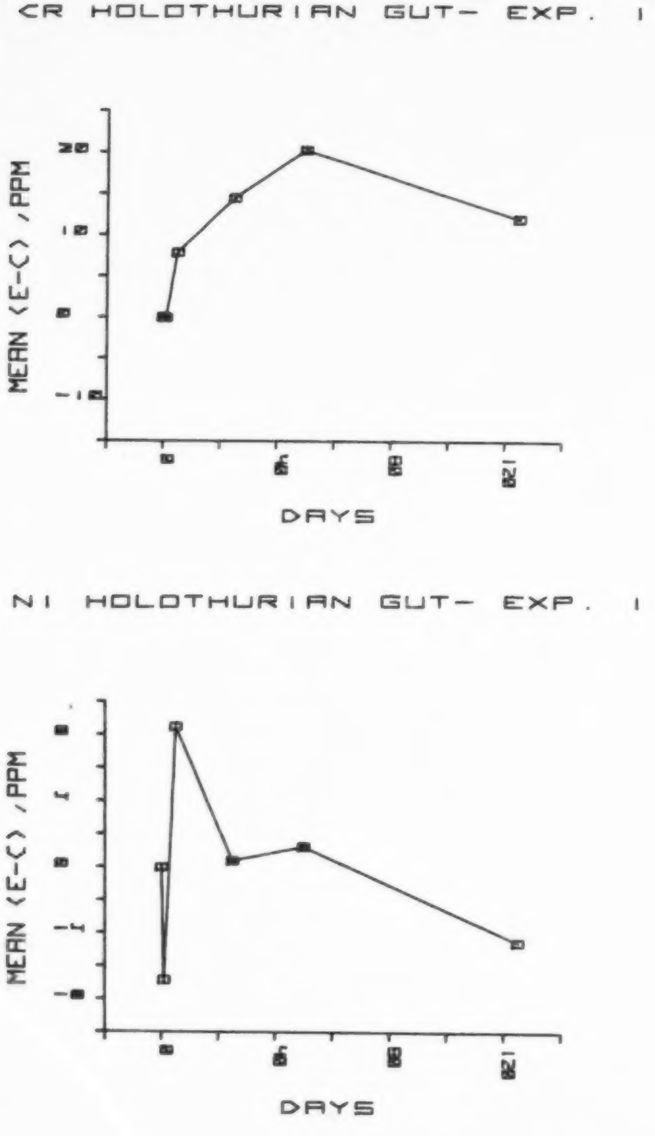


Figure 38. Mean net uptake of Cr and Ni between experimental and control, sea cucumber guts - Experiment I.

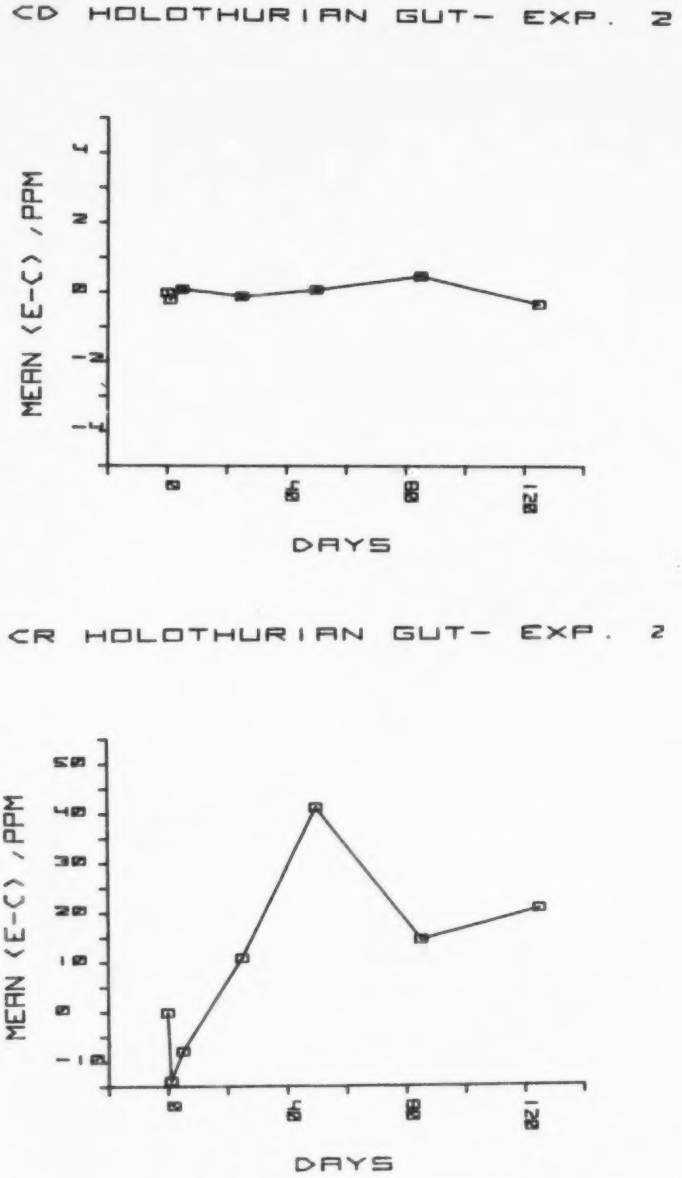


Figure 39. Mean net uptake of Cd and Cr between experimental and control, sea cucumber guts - Experiment II.

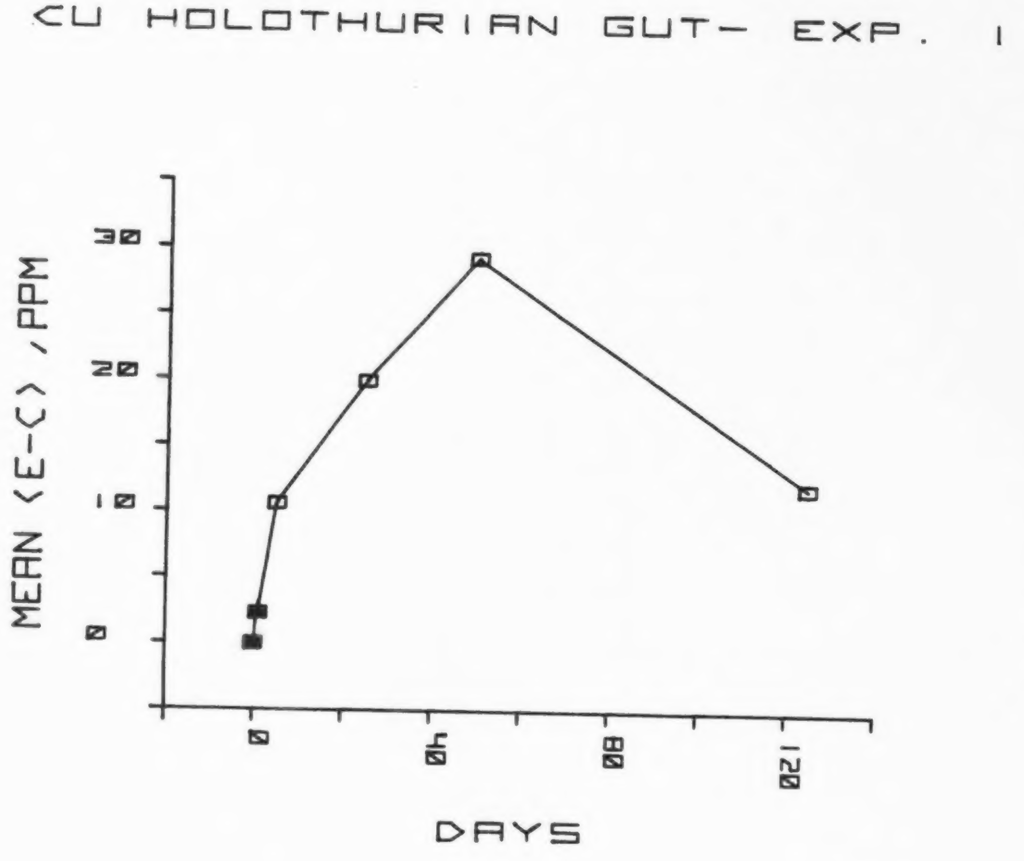


Figure 40. Mean net uptake of Cu between experimental and control, sea cucumber guts - Experiment I.

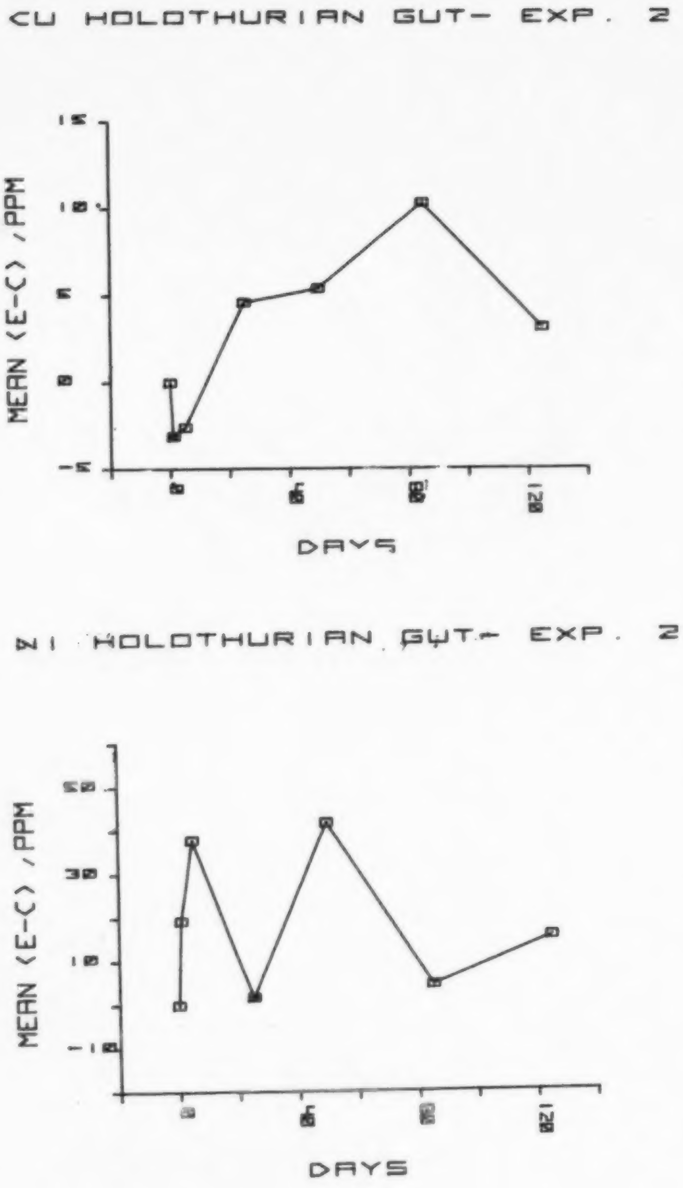
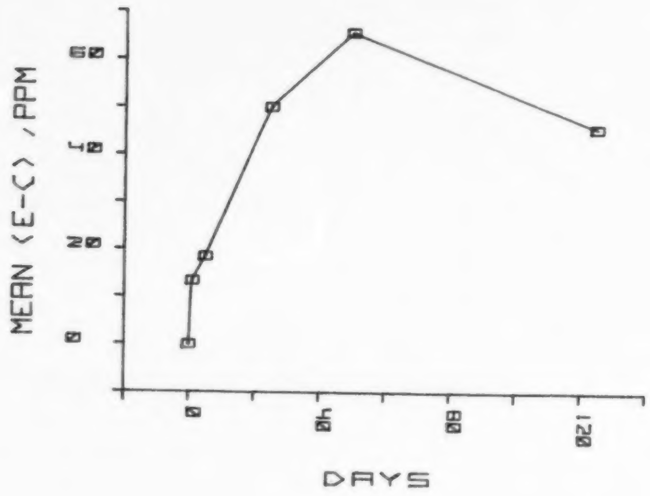
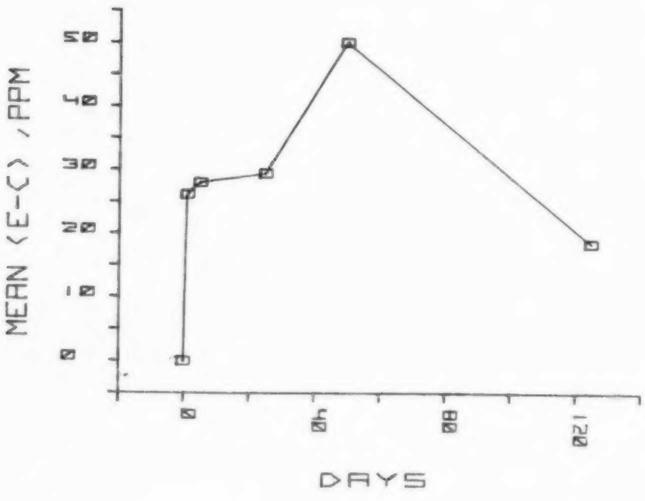


Figure 41. Mean net uptake of Cu and Ni between experimental and control, sea cucumber guts - Experiment II .



PB HOLOTHURIAN GUT- EXP. I



ZN HOLOTHURIAN GUT- EXP. I

Figure 42. Mean net uptake of Pb and Zn between experimental and control, sea cucumber guts - Experiment I.

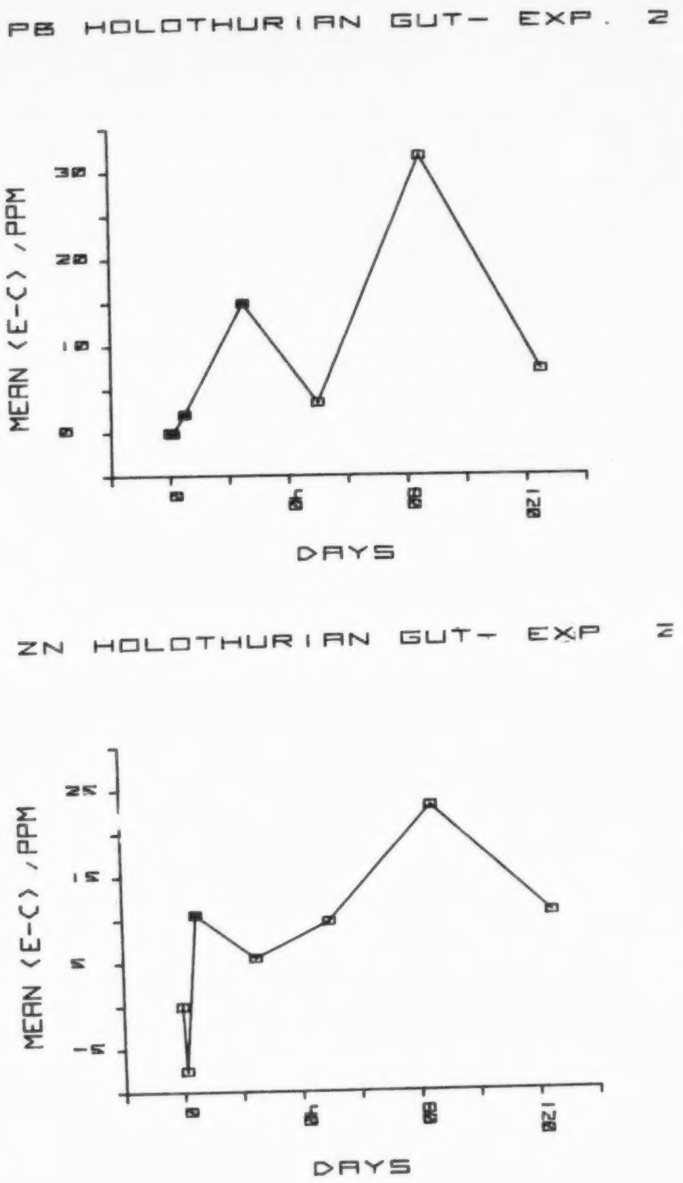


Figure 43. Mean net uptake of Pb and Zn between experimental and control, sea cucumber guts - Experiment II.

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APPENDIX A

Sorted Raw Data Experiment I and II

There are eleven (11) columns shown which represent the following:

Column

1 - Animal type

C = Clam
H = Holothurian
M = Mangrove
T = Thalassia
P = Fouling Organisms
U = Urchin
S = Sediment

2 - Tissue type

M = Muscle
I = Internal contents (guts)
S = Shell
B = Body/Bottom
L = Leaves
R = Roots and rhizomes
G = Upper Meristem
D = Solids

3 - Experiment number - I(1) or II(2)

4 - Sample type - whether from experimental tank (0) or control tank (1)

5 - Represents sample time

0 = presample
1 = 1 day after sewage added
5 = 5 days " " "
25 = 25 " " " "
50 = 50 " " " "
85 = 85 " " " "
125 = 125" " " "

6 = Concentration (µg/g dry weight) Cd
7 = " " Cr
8 = " " Cu
9 = " " Ni
10 = " " Pb
11 = " " Zn

Multiple values for the same sample represent replicate samples. The value -999.9 is an indication of a value that could not be detected. All manipulation of the data used one half minimum detectable concentration (MDC) when a value was less than or equal to the MDC. The MDC values are listed in the Results (Table 4).

```
                  SORTED DATA        1
C I 1 0   0     2.4   -999.9     31.6  -999.9  -999.9    81.0
C I 1 0   0     2.7   -999.9     31.4  -999.9  -999.9    83.0
C I 1 1   0  -999.9   -999.9     17.5  -999.9  -999.9   108.2
C I 1 1   0     2.0       .0     10.4     6.7     4.5   167.6
C I 1 1   0      .9      1.7     14.4     6.9     5.0    89.4
C I 1 1   0     1.0      1.1     17.4     7.9     5.9   107.4
C I 1 0   1  -999.9   -999.9     10.6  -999.9  -999.9   164.7
C I 1 0   1  -999.9   -999.9     10.0  -999.9  -999.9   164.3
C I 1 0   1      .9   -999.9      7.0     7.5     6.5   191.2
C I 1 1   1  -999.9   -999.9     21.9  -999.9  -999.9   270.1
C I 1 1   1     4.2   -999.9     26.2  -999.9  -999.9   306.9
C I 1 0   5  -999.9   -999.9     11.2  -999.9    10.2   216.3
C I 1 0   5  -999.9   -999.9      9.9  -999.9    14.1   241.9
C I 1 1   5     3.7   -999.9     20.6  -999.9  -999.9   211.4
C I 1 1   5  -999.9   -999.9     19.6  -999.9  -999.9   216.0
C I 1 0  25     2.0   -999.9      9.8  -999.9  -999.9   187.2
C I 1 0  25     2.0   -999.9     12.3     9.1  -999.9   184.6
C I 1 1  25  -999.9   -999.9     27.4  -999.9  -999.9    85.2
C I 1 1  25     2.0       .8     15.2    10.4     6.6   101.8
C I 1 0  50     2.4      3.7      9.7     9.4     5.6   187.1
C I 1 0  50     3.5      5.8      8.5     5.0    10.5   194.0
C I 1 0  50     1.2   -999.9      9.5     7.6    10.0   168.3
C I 1 1  50     5.0      3.5     10.6    14.1    12.7   353.6
C I 1 1  50     3.6      3.0      7.5    11.3    10.7   268.3
C I 1 1  50     1.5      1.9      5.8     9.6     6.1   187.5
C I 1 0 125     1.6      1.4      5.5     5.0     5.8   139.6
C I 1 0 125     1.6      2.1      4.8     2.0     4.4   109.6
C I 1 0 125     1.3   -999.9      4.7     2.8     5.3    99.7
C I 1 0 125     1.4   -999.9      6.0     6.8     5.9   119.0
C I 1 0 125     1.4   -999.9      6.4     6.8     5.8   114.6
C I 1 1 125     2.0   -999.9      1.8     2.0     6.2    69.8
C I 1 1 125     2.0      2.8      5.2     5.0     6.2   119.5
C I 1 1 125     1.6      2.5      5.1     7.9     4.0   120.5
C I 1 1 125     1.5      3.1      5.3     7.6     4.7   117.1
C S 1 0   0     4.0   -999.9      1.2  -999.9    20.8     1.7
C S 1 0   0     4.0   -999.9      1.4  -999.9    20.0     2.6
C S 1 0   0     3.3      6.7      6.1    32.9    49.8     3.0
C S 1 0   0     3.1       .0       .0    33.8      .0     3.6
C S 1 1   0     4.0   -999.9      1.4  -999.9    10.5     3.3
C S 1 1   0     3.0   -999.9      1.4  -999.9    13.4     1.5
C S 1 1   0     3.4      1.4      5.6    33.7    49.6     4.6
C S 1 1   0     3.4      3.1      5.4    34.0    54.5     5.2
C S 1 0   1  -999.9   -999.9      1.4  -999.9    13.5     1.6
C S 1 0   1     4.6      5.2       .0    36.9    13.3     5.5
C S 1 0   1     3.1      6.4      6.0    34.0    57.0     3.3
C S 1 0   1     3.1      6.8      6.1    34.0    53.9     3.6
C S 1 1   1  -999.9   -999.9      1.3  -999.9    11.4      .5
C S 1 1   1  -999.9   -999.9      1.2  -999.9    15.9      .3
C S 1 1   1     3.1      6.9      6.2    33.7    51.0     4.2
C S 1 1   1     3.1      6.9      6.2    34.0    51.9      .0
C S 1 0   5  -999.9   -999.9      2.4  -999.9    20.0     1.3
C S 1 0   5  -999.9   -999.9      1.6  -999.9    11.5      .9
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                    SORTED DATA        2
C S 1 0   5     3.6      3.1      5.5    33.2    42.1      4.3
C S 1 0   5     3.4      2.9      5.6    32.9    41.2      3.6
C S 1 1   5  -999.9   -999.9      1.6  -999.9    11.4       .2
C S 1 1   5  -999.9   -999.9      1.7  -999.9    11.7      1.5
C S 1 1   5     3.3      2.7      5.5    33.7    46.8      3.9
C S 1 1   5     3.5      2.3      5.6    33.8    50.7      3.9
C S 1 0  25  -999.9   -999.9      1.2  -999.9    17.2       .6
C S 1 0  25     4.6      3.8      6.3      .0    14.0      6.4
C S 1 0  25     3.4      1.3      5.8    34.6    49.0      4.2
C S 1 0  25     3.3      2.5      6.2    33.7    49.7      4.3
C S 1 1  25  -999.9   -999.9      1.4  -999.9    10.1   -999.9
C S 1 1  25  -999.9   -999.9      1.2  -999.9     9.3       .2
C S 1 1  25     3.5   -999.9      5.6    33.8    43.8      3.7
C S 1 1  25     3.7      2.5      5.2    33.9    42.9      3.6
C S 1 0  50     5.0      3.8      6.5    31.1    14.3      6.4
C S 1 0  50     5.0      3.4      6.7    30.8     8.8      4.7
C S 1 0  50     3.7      2.0      5.2    33.7    42.7     20.8
C S 1 0  50     3.5      3.1      5.1    34.2    42.0     26.6
C S 1 1  50     4.6      3.5      6.9    36.6    15.0      7.9
C S 1 1  50     4.4      3.4      6.5    36.8    12.7      5.0
C S 1 0 125     5.4      3.2      5.8    32.8    49.3      4.3
C S 1 0 125     5.4      3.7      5.4    33.0    45.6      2.5
C S 1 0 125     3.3      2.7      6.0    33.8    49.6      7.0
C S 1 0 125     3.3      2.6      5.5    33.2    43.9      3.6
C S 1 1 125     4.9      4.7      5.5    30.0    43.3      3.0
C S 1 1 125     5.3      3.7      5.5    31.9    46.6      3.2
H B 1 0   0     1.4   -999.9      1.8    13.9     6.1     19.8
H B 1 0   0     1.5   -999.9      2.0    10.0     7.9     16.3
H B 1 1   0     2.3       .8      2.8    11.9    10.5     20.3
H B 1 1   0     2.5       .3      3.3    12.0    10.6     25.1
H B 1 0   1  -999.9   -999.9      1.7     8.9     2.8      9.4
H B 1 0   1     1.5   -999.9      3.4    11.9    11.3     11.9
H B 1 1   1  -999.9   -999.9      1.9    13.0     3.4      8.0
H B 1 1   1     1.6       .4      1.8    11.0     7.6     10.0
H B 1 0   5     1.4   -999.9      1.6    10.9    11.4      9.9
H B 1 0   5     1.3   -999.9      2.1    10.0    12.0     14.0
H B 1 0   5     2.4       .5      2.4      .0    11.9     12.5
H B 1 0   5     2.5       .5      2.4    10.4    12.6     14.1
H B 1 1   5     1.4   -999.9      1.5    11.0     6.7      8.7
H B 1 1   5     1.3   -999.9      1.2    10.0     6.2      7.5
H B 1 0  25     1.3       .9      2.0    11.0     2.9     10.0
H B 1 0  25     1.6       .6      2.0    12.9    12.3      9.9
H B 1 1  25     1.0   -999.9      1.5     6.9     6.1      7.7
H B 1 1  25      .8   -999.9      1.2     6.2     5.5      5.6
H B 1 0  50     2.1      1.3      2.1    10.0     2.8     29.9
H B 1 0  50     2.7      2.3      2.7    10.0     2.8      9.0
H B 1 0  50     2.4      2.0      3.0      .0    10.8     10.8
H B 1 0  50     2.4      2.6      3.4     7.7    14.7     11.8
H B 1 1  50     9.8      1.0      9.8    11.0     2.9     15.1
H B 1 1  50     2.0      1.5      2.0     9.0     3.2     12.0
H B 1 0 125      .9       .7      1.7      .0    10.5      6.5
H B 1 0 125      .9      1.4      2.1      .0    12.0      7.5
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                SORTED DATA      3
H B 1 1 125       1.4    -999.9       1.6        .0       9.0       6.1
H B 1 1 125       2.5       1.7       3.0       7.5      12.6      11.8
H B 1 1 125       2.4       1.4       2.6       7.8      12.8      10.8
H I 1 0   0       1.0       8.0       8.6      17.1       5.9      37.9
H I 1 0   0       1.3       7.0      10.1      19.9       2.4      26.3
H I 1 1   0       1.1      13.3       9.9      20.1       5.9      38.4
H I 1 1   0       1.1      22.3      14.0      30.9      12.0      42.7
H I 1 1   0        .0      18.6      11.9      25.8      11.9      41.8
H I 1 1   0       2.3      19.2       8.5      22.6      11.7      43.9
H I 1 1   0       2.3      19.2       8.0      21.8      11.3      45.7
H I 1 0   1       1.5       7.0      10.1      13.0        .0      69.8
H I 1 0   1       2.4      11.8      10.1      15.8      16.7      56.4
H I 1 0   1       2.4      10.6       9.9      14.8      16.8      55.9
H I 1 1   1    -999.9       9.0       8.7      19.0       2.8      31.8
H I 1 1   1       1.7      10.8      11.1      23.7       4.0      37.5
H I 1 0   5       2.0      14.9      15.0      24.9      17.3      56.7
H I 1 0   5    -999.9      12.9      15.0      24.8      25.8      55.6
H I 1 1   5    -999.9       7.0       8.4      16.9       2.8      29.0
H I 1 1   5       1.5       5.3       8.6      15.8       3.3      27.3
H I 1 0  25       3.3        .0        .0        .0        .0        .0
H I 1 0  25       3.8      27.0      31.4      22.4      66.2      68.6
H I 1 0  25       3.6      25.0      28.2      21.4      60.2      62.0
H I 1 1  25       2.1      12.0      10.1      28.0        .0      37.0
H I 1 1  25    -999.9      10.4        .0      17.4      13.4        .0
H I 1 1  25       3.4      11.5       9.5      21.6      14.8      34.6
H I 1 1  25       2.8      12.6      10.1      18.9      11.9      36.0
H I 1 0  50       2.7      27.9      33.9      21.0      75.8      79.8
H I 1 0  50       3.7      31.9      40.8      23.9      82.8      79.7
H I 1 1  50       1.6        .0        .0        .0      12.0      27.9
H I 1 1  50       1.6       8.0        .0      19.9      10.6      19.9
H I 1 1  50       2.6      10.5       9.5      21.7      15.6      35.2
H I 1 1  50       2.7      10.6      10.4      21.9      15.9      35.6
H I 1 0 125       2.3      29.6      25.7      23.7      71.0      60.8
H I 1 0 125       2.4      29.7      27.9      24.0      65.3      64.4
H I 1 1 125       2.1      18.0      13.0      28.0        .0      46.9
H I 1 1 125       2.1      18.0      20.0      28.9      25.0      43.9
H I 1 1 125       3.4      17.6      12.9      28.8      22.9      41.8
H I 1 1 125       3.4      17.6      13.5      27.9      19.9      43.9
H M 1 0   1    -999.9    -999.9       2.7       7.9       1.6      54.3
H M 1 0   1       1.4       2.0       3.2       8.6      10.5      99.5
H M 1 0   1       1.4       2.3       2.7        .0      11.9        .0
H M 1 0   1       2.0       2.3       4.7       8.9       9.9      66.8
H M 1 0   1       1.0    -999.9       3.5       7.0       9.8      64.2
H M 1 1   1    -999.9        .8       2.4       8.0       1.6      40.5
H M 1 1   1       1.6       3.2       3.2      11.6      12.0      65.8
H M 1 1   1       2.0       3.7       5.8      10.8       9.8      57.6
H M 1 1   1       2.0       3.6       4.8      10.8       9.8      57.8
H M 1 0   5        .0       3.4       5.6      11.9       3.0      69.1
H M 1 0   5    -999.9        .2       4.0       8.0       1.6      47.0
H M 1 0   5       2.8       3.6       5.5      10.8      12.8      70.2
H M 1 0   5       2.4       3.1       4.9      10.8      12.8      63.8
H M 1 1   5    -999.9    -999.9       2.6       8.0       9.9      43.6
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                SORTED DATA       4
H M 1 1     5       1.4       1.6        3.6       9.1       9.5      47.5
H M 1 0    25    -999.9    -999.9        4.5       3.9      11.6      67.9
H M 1 0    25    -999.9    -999.9        4.7       3.8      14.2      67.5
H M 1 1    25       1.7    -999.9        3.4       3.8      13.9      62.1
H M 1 1    25    -999.9    -999.9        2.7       3.9      13.2      66.6
H M 1 0    50       1.0       3.9        3.1      11.8      12.2      39.2
H M 1 0    50       1.0        .4        2.2       7.9       7.1      29.5
H M 1 0    50       2.2       9.2        6.4      13.2      12.0      46.1
H M 1 0    50       2.4      10.6        7.6      16.0      13.3      52.7
H M 1 0   125       1.2       4.0        4.7       9.9       2.9      51.7
H M 1 0   125       1.4       3.4        4.5      10.0       2.9      47.8
H M 1 1   125       1.1       3.2        2.9      15.9       5.3      32.9
H M 1 1   125       1.7       5.4        6.2      10.0       8.8      42.8
H M 1 1   125       3.6       6.8        7.0      19.9      16.9      56.5
H M 1 1   125       3.5       6.8        7.0      19.6      15.7      51.6
M B 1 0     0        .5       3.9        3.2       1.9    -999.9       4.5
M B 1 0     0        .0        .1        2.5       1.7        .0       5.1
M B 1 0     0        .5        .1        3.1       1.6    -999.9       4.5
M B 1 1     0        .3    -999.9        2.9       1.5    -999.9       4.3
M B 1 1     0        .5    -999.9        2.9       1.4    -999.9       5.6
M B 1 1     0        .5    -999.9        2.9       1.2    -999.9       4.3
M B 1 0     5       1.5    -999.9        2.1       3.0    -999.9       1.4
M B 1 0     5        .5    -999.9        2.0       3.0    -999.9       2.5
M B 1 1     5        .4    -999.9        2.6        .0    -999.9       1.9
M B 1 1     5        .4    -999.9        2.5        .0    -999.9       1.8
M B 1 0    50        .7    -999.9        2.6        .0    -999.9       2.6
M B 1 0    50        .6    -999.9        2.1        .0       3.0       2.2
M B 1 1    50        .7    -999.9        2.7       3.0    -999.9       1.6
M B 1 1    50        .7    -999.9        2.5       3.0    -999.9       2.1
M B 1 1   125        .7    -999.9        2.7        .0       3.0       2.5
M B 1 1   125       1.0    -999.9        3.6        .0       4.0       3.3
M G 1 0     0        .3       3.9        3.9       2.2    -999.9       6.2
M G 1 0     0        .3       3.7        3.8       1.8    -999.9       5.7
M G 1 1     0        .3        .1        3.2       1.9    -999.9       5.7
M G 1 1     0        .3        .1        3.1       2.3    -999.9       5.2
M G 1 1     0        .4    -999.9        2.9       2.4    -999.9       6.0
M G 1 0     5       1.2    -999.9        4.0       2.4    -999.9       3.8
M G 1 1     5       1.0       4.8        8.3       9.6      16.0      31.6
M G 1 0    50        .8    -999.9        4.4       2.2       4.0       2.8
M G 1 0    50        .8    -999.9        4.9       2.3       4.0       3.1
M G 1 1    50       1.4    -999.9        6.0       1.6    -999.9       4.8
M G 1 1    50       1.4    -999.9        5.9       1.8    -999.9       6.7
M G 1 0   125       1.0    -999.9        4.4       4.0       5.0       6.4
M G 1 0   125       1.0    -999.9        4.2       3.4       3.0       4.9
M G 1 1   125       1.1    -999.9        4.2       2.1       4.0       4.3
M G 1 1   125       1.0    -999.9        4.2       2.6       3.0       4.1
M L 1 0     5        .6    -999.9        4.3        .0    -999.9       8.3
M L 1 0     5        .8    -999.9        4.2        .0    -999.9       8.0
M L 1 1     5       1.5    -999.9        9.0       4.5    -999.9      11.5
M L 1 0    50       1.1    -999.9        7.0       3.4       5.0       8.1
M L 1 0    50       1.0    -999.9        6.3       3.5       4.0       7.5
M L 1 1    50       1.1    -999.9        7.4       7.0       7.0      11.5
```

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                SORTED DATA        5
M L 1 1  50       1.2    -999.9       7.7       8.0       6.0      12.0
M L 1 0 125       1.0        .2       5.4        .0       6.0      10.0
M L 1 0 125        .9    -999.9       6.0        .0       5.0      10.5
M L 1 1 125       1.2    -999.9       6.1        .0       4.0       7.6
M L 1 1 125       1.1    -999.9       5.9        .0       4.0       7.8
M R 1 0   5       1.2        .6       4.0        .0       4.0      12.5
M R 1 0   5       1.2    -999.9       3.3        .0       4.0      10.6
M R 1 1   5       1.1    -999.9       3.7       6.0       5.0       8.1
M R 1 1   5       1.0    -999.9       3.6       6.0       6.0       7.6
M R 1 0  50       1.8       1.0       4.6       9.0       8.0      24.0
M R 1 0  50       1.8       1.0       4.5       9.0       7.0      23.9
M R 1 1  50       1.6       1.0       4.4        .0       6.0      12.3
M R 1 1  50       1.4        .0       4.0       5.5       5.0      10.3
M R 1 0 125       1.6       8.0       8.8      17.9      11.0      53.8
M R 1 0 125        .5       6.0       8.3      15.0      10.0      44.9
M R 1 1 125       1.2       3.8       4.8      10.8       8.9      26.0
M R 1 1 125       1.2       4.2       4.0      10.8       6.9      33.5
M R 1 1 125       1.1       2.9       3.5      10.5       6.7      31.4
N I 1 0   0       5.4      10.8      46.9      27.0      40.9     119.7
N I 1 1   0       3.5       3.5      55.2      27.4      20.8     129.3
N I 1 1   1    -999.9    -999.9      62.2    -999.9      23.3     173.6
N I 1 0   5       3.1    -999.9      58.4      24.0      18.1     157.0
N I 1 1   5    -999.9    -999.9      50.3    -999.9      28.7     168.6
N I 1 0  25    -999.9    -999.9      56.0    -999.9      34.2     118.5
N I 1 1  25    -999.9       7.4      49.6    -999.9      34.4     189.1
N I 1 0  50       4.1       5.6      53.8      16.4       6.2     168.5
N I 1 1  50       3.2    -999.9      50.7      17.3      16.7     141.8
N I 1 0 125       3.0      41.6      21.4       9.9       3.8      82.3
N S 1 0   0    -999.9    -999.9    -999.9    -999.9      79.1       8.9
N S 1 0   0    -999.9    -999.9    -999.9    -999.9      79.3       5.2
N S 1 0   0       5.7       6.8       6.3      33.8      46.8       5.6
N S 1 0   0       5.5       6.5       6.3      35.8      48.7       6.5
N S 1 1   0    -999.9    -999.9       2.0    -999.9      75.1       7.4
N S 1 1   0    -999.9    -999.9       3.0    -999.9      76.6       7.5
N S 1 0   1    -999.9    -999.9    -999.9    -999.9      74.8       8.6
N S 1 0   1    -999.9    -999.9    -999.9    -999.9      72.5       9.6
N S 1 1   1    -999.9    -999.9       3.0    -999.9      61.8      12.3
N S 1 1   1    -999.9    -999.9       3.0    -999.9      56.8      11.6
N S 1 0   5    -999.9    -999.9    -999.9    -999.9      81.7       8.9
N S 1 0   5    -999.9       4.7    -999.9        .0      51.8       7.0
N S 1 1   5    -999.9    -999.9       3.0    -999.9      72.6       9.4
N S 1 1   5       3.5    -999.9       2.0    -999.9      73.1       8.6
N S 1 0  25    -999.9    -999.9    -999.9    -999.9      72.6      11.5
N S 1 0  25    -999.9    -999.9    -999.9    -999.9      72.8       9.7
N S 1 1  25    -999.9    -999.9       7.6    -999.9      71.9      11.4
N S 1 1  25    -999.9    -999.9       3.9    -999.9      67.0      13.6
N S 1 0  50       4.2       3.4       6.6      32.7      42.6       7.1
N S 1 0  50       4.3       3.8       6.8      33.6      43.8       7.1
N S 1 1  50       4.2       2.1       6.6      33.6      41.8       7.9
N S 1 1  50       3.6       2.3       6.0      32.6      38.7       8.6
N S 1 1  50       5.1       6.9       6.2      32.6      47.0       7.0
N S 1 1  50       5.0       6.3       6.1      33.0      48.4       6.4
```

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                SORTED DATA       6
N S 1 0 125        4.3       3.5       7.1      33.9      43.8       7.2
N S 1 0 125        4.4       3.4       7.1      33.9      41.1       6.8
O I 1 0   0        2.6       3.3     532.2      11.2      11.2    1037.6
O I 1 0   0        2.7       5.8     613.9      12.4      10.3    1593.2
O I 1 1   0        3.9       8.9     520.0      14.4      15.5    1384.2
O I 1 1   0        1.1       2.3     217.0       4.9       3.7     414.5
O I 1 0   1        2.5       1.2     220.9      10.9       8.8    1057.0
O I 1 1   1        2.6       4.2     121.6       8.9      10.0     916.8
O I 1 0   5        4.0       3.9      87.9      13.2      36.2     527.6
O I 1 1   5        2.8       1.3     290.6       7.1       5.7    1150.0
O I 1 0  25        6.9       4.0     363.9      30.9      33.5     611.7
O I 1 1  25        3.9       3.9     106.3       7.5       5.7     620.1
O S 1 0   0        5.0       4.4       7.9      34.9      42.6      14.0
O S 1 0   0        5.0       4.4       7.9      34.9      42.0      13.2
O S 1 1   0        3.4       4.0       7.8      36.4      39.5      19.5
O S 1 1   0        3.5       4.7       8.0      36.9      41.4      20.3
O S 1 0   1        4.3       4.5       7.1      36.9      13.0      14.4
O S 1 0   1        4.4       4.6       8.1      37.0      12.3      16.4
O S 1 1   1        4.3       4.0       7.1      38.9      13.7      14.0
O S 1 1   1        4.6       3.6       7.1      36.9      12.3      13.6
O S 1 0   5        3.9       3.4       6.9      35.9      39.9       9.2
O S 1 0   5        4.3       4.2       7.3      37.9      47.8       9.4
O S 1 0   5        5.6       4.8       6.7        .0      44.7       8.1
O S 1 0   5        5.8       5.2       6.9        .0      53.4       7.9
O S 1 1   5        4.1       4.0       7.1      37.0      13.7      12.4
O S 1 1   5        4.4       4.5       7.1      36.9      12.6      12.0
O S 1 0  25        4.9       5.6       9.4      33.8      12.1      18.1
O S 1 0  25        5.5       6.3       5.0      37.5      13.2      23.0
O S 1 0  25        5.9       3.3       7.8        .0      49.4      27.0
O S 1 0  25        5.6       4.5       7.9        .0      44.4      29.0
O S 1 1  25        3.9       2.8       6.7      33.8      41.8       9.7
O S 1 1  25        4.3       5.0       7.6      37.8      50.8       9.0
P D 1 0  25         .0     179.7      57.1     204.5      69.3      99.2
P D 1 0  25        1.5     161.7     784.0     205.2      13.6     105.7
P D 1 1  25        6.0      42.5      34.7      62.7       6.3      78.4
P D 1 1  25        1.9        .0      46.3      20.3       5.4      76.7
P D 1 0  50        1.7     209.1      82.9     306.7      13.6     109.6
P D 1 1  50        3.6      79.2      55.6     105.6       5.9      82.5
P D 1 0 125        4.3      42.7      70.3      69.6      27.6     224.7
P D 1 1 125        1.6      43.9      36.0      71.6      17.5      59.6
P D 1 1 125        1.8      49.7      38.0      71.6      17.1      67.7
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                SORTED DATA       7

S     1 0   0  -999.9       6.0      10.9       4.0      11.9      21.8
S     1 0   0  -999.9       7.0      12.0       4.0      17.0      24.8
S     1 1   0  -999.9       5.0      11.0       7.0      13.0      20.3
S     1 1   0  -999.9       6.0      11.0       9.0      14.0      20.0
S     1 0   1  -999.9       7.0      10.0       9.0      11.0      20.0
S     1 0   1  -999.9       8.0      10.9       7.0      18.9      21.9
S     1 1   1  -999.9       8.0      10.9       9.0      12.9      20.7
S     1 1   1  -999.9       7.0      11.9       9.0      16.9      20.7
S     1 0   5  -999.9       5.0       9.9       4.0      10.9      17.1
S     1 0   5  -999.9       7.0      11.0       7.0      15.0      19.2
S     1 1   5  -999.9       7.0      10.9       7.0      15.9      20.7
S     1 1   5  -999.9       6.0      12.0      11.1      19.9      21.1
S     1 0  25  -999.9       5.9      10.9       6.9      14.9      20.6
S     1 0  25  -999.9       8.0      10.0       7.0      12.9      18.7
S     1 1  25  -999.9       8.0      15.9      11.9      23.9      23.5
S     1 1  25      .6       7.0       8.4       9.8      10.0      18.8
S     1 0  50      .7       7.5       8.0       9.2      10.0      18.0
S     1 0  50      .6       6.9       8.4       9.6      10.0      18.8
S     1 1  50      .6       6.4       8.8       8.2      10.2      19.7
S     1 1  50     3.6       4.6       8.6      17.6       9.8      18.8
S     1 0 125     2.8      11.7      10.9      17.9      10.5      19.4
S     1 0 125     1.1       9.7      10.0      15.9      13.4      17.1
S     1 1 125     4.8      13.0      12.0      17.9      11.4      24.3
S     1 1 125     4.0      10.8      11.0      16.0       9.7      19.2
T L 1 1   0  -999.9    -999.9      15.8    -999.9      13.8      47.3
T L 1 1   0     2.3       2.7      13.2      12.9       9.9      30.1
T L 1 1   0     2.5       2.8      13.1      13.8      10.8      32.5
T L 1 0   1     2.6      30.8      22.1      60.0      34.0      53.9
T L 1 0   1     1.7      31.0      21.9      50.8      33.9      45.8
T L 1 0   1     3.9      23.6      20.7      46.7      30.8      48.7
T L 1 0   1     3.8      25.2      20.4      43.1      29.4      52.8
T L 1 1   1     2.4      23.9      14.0      40.9      16.9      43.4
T L 1 1   1     2.6      21.0      16.0      40.9      15.0      39.4
T L 1 1   1     4.0      16.4      14.5      35.4      14.7      37.8
T L 1 1   1     3.9      16.6      14.7      36.7      12.9      39.3
T L 1 0   5     1.3      28.8      21.8      46.7      31.8        .0
T L 1 0   5     2.0      26.9      25.9      43.9      31.9      47.2
T L 1 0   5     3.6      23.6      21.8      43.7      30.8      45.9
T L 1 0   5     3.6      23.6      21.8      42.7      29.8      44.8
T L 1 1   5     1.3      30.6      15.8      46.4      26.7      37.0
T L 1 1   5     2.0      29.7      13.0        .0      16.0      34.4
T L 1 1   5     3.3      39.3      16.8      46.8      18.7        .0
T L 1 0  25  -999.9      67.8      32.1      39.3      35.7      30.7
T L 1 0  25    10.4      63.4      29.8      41.0      41.0        .0
T L 1 0  25     2.8        .0        .0        .0        .0      27.4
T L 1 0  25     2.8        .0        .0        .0        .0      27.5
T L 1 0  25      .0        .0      21.9      49.7      33.8      29.8
T L 1 0  25      .0        .0      29.4      60.0      31.9      28.1
T L 1 1  25     5.2      25.5      14.2      31.2      17.0      31.7
T L 1 1  25     3.2        .0        .0      32.6      13.7        .0
T L 1 1  25     6.7      39.4        .0        .0      19.7      34.6
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              SORTED DATA        8
T L 1 1  25      10.0        .0                  .0        .0        .0
T L 1 0  50       4.2      90.6      63.9      75.9      94.7      56.3
T L 1 0  50       6.0      98.6      65.6      77.2     100.0        .0
T L 1 0  50       3.9        .0      49.7      59.0      91.3      53.1
T L 1 1  50       8.3      34.0      19.5      46.7      16.7      26.5
T L 1 1  50      11.2      34.1      25.3      37.3        .0        .0
T L 1 1  50      10.9      39.5      22.7      44.4      19.8      31.1
T R 1 1   0    -999.9       5.9    -999.9    -999.9      15.5      27.2
T R 1 1   0    -999.9       4.1    -999.9    -999.9      15.5      23.6
T R 1 0   1       1.0      27.4      15.7      46.1      28.4      35.3
T R 1 0   1       1.3      24.9      16.0      40.9      28.9      33.0
T R 1 1   1    -999.9      20.0      12.0      29.9      20.0      28.9
T R 1 1   1       1.0      27.8      11.9      27.8      21.8      35.2
T R 1 1   1       3.4      15.6      12.2      30.2      20.1      30.8
T R 1 1   1       3.4      21.2      13.4      30.4      21.2      32.9
T R 1 0   5    -999.9      32.9      15.9      43.6      31.7      37.7
T R 1 0   5       1.5      32.9      12.9      43.8      27.9      30.4
T R 1 0   5       2.9      32.7      13.4      48.1      24.0      34.9
T R 1 0   5       2.8        .0      14.2      50.3      25.6      35.5
T R 1 1   5       2.6        .0      15.8      40.4      15.8      34.5
T R 1 1   5       3.2      29.9      15.0      45.8        .0      39.4
T R 1 1   5       3.3      30.8      15.4      43.7                37.2
T R 1 1   5       2.9      28.8      12.9      40.8      19.9      36.3
T R 1 0  25       1.3      33.0      17.0      46.9      22.0      25.0
T R 1 0  25       1.0      45.4      24.7      50.4      24.7      34.8
T R 1 0  25       2.0      41.7      17.9      43.7      21.8      32.8
T R 1 0  25       2.4      40.0      16.9      42.8      19.9      44.9
T R 1 1  25       1.1      22.7      11.8      37.5      24.7      27.2
T R 1 1  25       1.3      21.8      11.9      33.8      24.8      27.3
T R 1 1  25       3.0      31.7      13.8        .0      17.8      28.7
T R 1 1  25       2.0      33.4      15.7      31.4      21.6      30.4
T R 1 0  50       2.1      46.2      29.2      46.2      39.0      34.9
T R 1 0  50       2.1      45.9      27.0      46.9      41.2      28.8
T R 1 0  50       2.9      64.5      34.8      56.5      49.6      45.8
T R 1 0  50       2.5      60.7      32.7      51.9      48.0      39.1
T R 1 1  50       2.2      27.9      16.3      33.8      12.3      29.8
T R 1 1  50       2.4      29.4      11.6      34.9      12.1      25.9
U I 1 0   0       1.0    -999.9       8.9      16.8      13.1      50.0
U I 1 0   0    -999.9    -999.9       7.9      19.7      15.1      39.4
U I 1 0   0       4.0       4.3       7.5      13.9      12.9      49.0
U I 1 0   0       3.9       5.1       7.8      15.3      13.4      47.2
U I 1 1   0       2.2      17.2      12.1      36.9      19.9        .6
U I 1 1   0        .0      14.0      11.1      35.9      16.0      48.2
U I 1 0   1        .0      10.3      11.6      21.4      16.1      63.1
U I 1 0   1    -999.9       9.4      11.7      21.4      19.4      59.3
U I 1 1   1       3.7      10.2       9.6      27.0        .0      44.5
U I 1 1   1    -999.9       9.3       7.8      23.3      18.7      44.9
U I 1 0   5       2.0      11.9      15.9      39.8      29.0      69.6
U I 1 0   5    -999.9      13.9      11.9      39.7      27.4      74.4
U I 1 1   5       2.6      10.9       7.9      27.7      20.9      34.8
U I 1 1   5       2.0      11.1      12.9      31.4      16.6      32.5
U I 1 1   5       4.7      11.5       9.8      23.9      16.2      35.3
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                SORTED DATA       9
U I 1 1   5        4.5      10.8       9.5      23.6      16.7      40.3
U I 1 0  25        3.0      27.9      22.0      39.9      37.9      91.5
U I 1 0  25        3.4      29.9      25.9      45.9      37.1      92.1
U I 1 0  25        6.3      23.5      20.2      36.6      39.6      85.9
U I 1 0  25        4.8      18.6      19.9      35.8      39.8      94.1
U I 1 1  25        3.4      14.0      14.0      21.9      16.6      53.9
U I 1 1  25        3.3      13.5      19.3        .0      18.2      50.2
U I 1 1  25        5.7       9.7      10.5      23.2      14.0      40.6
U I 1 1  25        5.9       9.7      11.1      23.0      18.0      44.9
U I 1 0  50        2.2      36.6      24.9      53.8      29.5      92.7
U I 1 0  50        2.4      36.4      27.0      57.9      32.7      96.8
U I 1 1  50        3.5      27.9      20.0      50.7      20.3        .0
U I 1 1  50        3.4      29.5      19.0      51.0      20.4        .0
U I 1 1  50        4.6      34.7      17.3      44.7      19.9      77.4
U I 1 1  50        4.6      34.7      17.4      44.6      19.8      77.3
U I 1 0 125        2.6      22.9      27.9      18.9      55.9     166.4
U I 1 0 125        2.3      18.9      22.9      17.0      46.6     207.0
U I 1 0 125        4.6      19.3      19.0      26.1      50.0     172.9
U I 1 0 125        4.6      22.6      19.3      25.4      49.8     187.8
U I 1 0 125        4.5      18.6      18.7      24.8      49.6     179.1
U I 1 0 125        4.3      19.6      19.4      24.8      49.7     171.2
U I 1 1 125        3.4       7.6       7.1      18.9      21.0      89.9
U I 1 1 125        3.7       6.5       8.0      19.0      19.6     114.6
U I 1 1 125        6.1       8.2       9.0      16.5      20.4     123.2
U I 1 1 125        6.2       8.7       8.8      16.3      20.4     118.2
U S 1 0   0     -999.9       4.4       1.0       1.0      34.9      11.3
U S 1 0   0        3.5       4.9       4.3      22.3      52.5      11.6
U S 1 1   0        3.5       4.9       4.1      22.9      43.0      12.4
U S 1 1   0        3.1       4.8       4.1      22.3      42.0      11.6
U S 1 0   1     -999.9       4.4       1.0       8.5      56.8      11.5
U S 1 0   1        2.8       3.8       1.0       3.9      55.1       9.4
U S 1 0   1        5.4       2.9       4.5       7.0      37.9       8.4
U S 1 0   1        5.8       3.3       4.2      16.4      35.6      26.2
U S 1 0   1        5.1       3.4       3.9      14.7      37.9      22.2
U S 1 1   1     -999.9       3.8       1.0       3.9      64.1      12.4
U S 1 1   1     -999.9       3.8       1.0       2.5      62.0      12.5
U S 1 0   5     -999.9       5.3        .9       5.2      56.2      10.4
U S 1 0   5     -999.9       5.9       1.0       4.0      56.5      12.7
U S 1 1   5        3.9       3.4       4.6        .8      44.8      12.4
U S 1 1   5     -999.9       3.6        .9       7.8      49.1      10.1
U S 1 1   5        5.5       2.6       4.4      15.6      38.1       8.3
U S 1 1   5        5.2       2.8       4.2      17.6      39.2       8.4
U S 1 0  25        3.9       3.5       6.1      30.9      12.8      10.0
U S 1 0  25        3.9       3.5       5.1      32.9      11.4      11.0
U S 1 1  25        3.7       2.8       4.4      30.9      10.5      13.0
U S 1 1  25        4.3       3.6       5.1      35.8      10.1      13.4
U S 1 0  50        4.4       6.5       6.2      28.9      57.8      14.9
U S 1 0  50        4.1       6.6       6.2      27.8      57.8      15.9
U S 1 1  50        5.0       6.5       6.2      29.8      60.7      15.9
U S 1 1  50        4.7       6.5       6.2      27.9      56.0      14.9
U S 1 0 125        4.8       6.5       6.6      27.8      57.7      16.4
U S 1 0 125        4.7       6.5       5.3      28.0      59.0      16.0
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                 SORTED DATA       10
U S 1 1 125          4.4       5.4        4.9      25.9      52.0      13.5
U S 1 1 125          4.7       5.4        5.0      28.0      51.2      13.5
Z D 1 0  25          4.9     185.4       74.6     201.8      15.7     126.7
Z D 1 1  25          5.7     260.8       89.7     248.1      15.3      67.0
Z D 1 0  50          2.3      10.0       19.2      49.5       7.8      30.4
Z D 1 1  50          2.9      97.5       42.9     113.1      47.2      46.8
Z D 1 1  50           .0     230.3       77.4     216.3      47.2        .0
C I 2 1   0          2.2       3.8       21.9       7.2    -999.9     111.7
C I 2 1   0          2.0       3.8       20.7       6.7       5.9     126.0
C I 2 1   0          2.2       3.6       22.9       6.5       5.0     121.4
C I 2 0   1          1.1       2.0       20.8       6.0       5.0     152.1
C I 2 0   1          1.1       2.0       20.3       5.6       4.0     151.9
C I 2 0   1          1.2       1.9       19.3       5.8       3.8     147.5
C I 2 1   1          1.3       1.8       26.7       6.4       3.7     112.7
C I 2 1   1          1.2       1.9       27.2       6.1       3.9     104.1
C I 2 1   1          1.0       1.9       28.5       5.8       4.4     106.1
C I 2 0   5          1.3       3.9       24.4       5.0       5.8     124.1
C I 2 0   5          1.6       4.8       26.7       5.8       5.8     128.7
C I 2 0   5          1.1       2.8       18.1       4.8       7.5     105.6
C I 2 1   5          1.4       1.8       14.2       4.0       2.8      65.8
C I 2 1   5          1.5       3.8       17.5       4.3       4.8      83.0
C I 2 1   5          2.2       4.5       16.8       5.0       8.1     119.4
C I 2 0  25          1.9       4.4       20.6       5.9       5.0      95.7
C I 2 0  25          2.0       3.8       18.8       5.7       5.0      79.2
C I 2 0  25          1.6       3.8       21.2       6.1       5.7      95.1
C I 2 1  25          1.6       4.8       12.5       6.4       5.8      85.4
C I 2 1  25          1.6       4.8       14.4       6.6       4.8      94.4
C I 2 1  25          1.5       4.8       12.8       7.0       4.8      99.2
C I 2 0  50          1.6       4.2       20.0       3.9       6.9      98.0
C I 2 0  50          1.6       4.2       20.8       4.0       4.0      90.6
C I 2 0  50          1.5       4.1       19.3       3.8       4.8     113.4
C I 2 1  50          1.8       4.1       13.5       3.8       3.8      66.2
C I 2 1  50          1.8       4.1       14.5       3.8       3.8      61.4
C I 2 1  50          1.7       3.5       11.8       3.8       2.8      56.7
C I 2 0  85          1.5       7.4       23.4       6.6       4.8     109.7
C I 2 0  85          1.3       6.5       21.2       6.3       5.9     101.5
C I 2 0  85          1.4       7.5       22.0       6.2       5.4     107.4
C I 2 1  85          1.0       6.5       23.2       6.0       4.9     103.0
C I 2 1  85          1.0       5.4       21.0       5.7       5.8      97.1
C I 2 1  85          1.1       6.4       27.2       5.7       5.3     109.7
C I 2 0 125          2.4       3.7       27.2       6.3       4.0      86.7
C I 2 0 125          2.3       3.7       26.1       5.2       4.1      87.8
C I 2 0 125          2.5       4.6       29.0       6.1       4.2      97.8
C I 2 1 125          1.6       4.7       12.9       5.9       2.7     140.6
C I 2 1 125          1.4       3.3       11.1       5.0       4.1     124.8
C I 2 1 125          1.5       3.2       11.2       5.9       3.2     131.1
C S 2 1   0          3.6       8.0        7.6      11.9      33.8       2.9
C S 2 1   0          3.5       7.8        7.6      12.4      35.5       2.3
C S 2 1   0          4.5       5.7        7.3      14.8      32.6       2.6
C S 2 0   1           .0       6.4        7.6      15.6      38.6       2.4
C S 2 0   1          2.4       7.8        8.1      15.6      37.1       3.6
C S 2 0   1          2.2       6.7        7.8      14.2      35.1       1.8
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                SORTED DATA        11
C S 2 1    1       2.6       6.7       8.7      15.2      36.2       3.0
C S 2 1    1       2.1       7.4       8.4      13.8      34.0       3.0
C S 2 1    1       2.1       7.6       8.9      17.1      47.6       4.5
C S 2 0    5       2.5       7.6       9.0      11.4      34.3       1.0
C S 2 0    5       2.9       6.8       7.8      12.8      35.9       1.4
C S 2 0    5       2.6       6.5       7.7      12.3      35.2       1.6
C S 2 1    5       4.0       7.1       7.7      12.4      35.5       1.6
C S 2 1    5       2.9       7.2       7.8      14.4      37.8       1.6
C S 2 1    5       2.7       7.4       8.0      12.0      34.1       1.6
C S 2 0   25       3.2        .0       7.8      14.4      35.2       2.8
C S 2 0   25       2.8        .0       8.3      13.8      34.9       6.1
C S 2 0   25        .0   *******       7.8      12.8      34.2       5.9
C S 2 1   25       2.8       8.6       7.9      13.3        .0       2.0
C S 2 1   25        .3       7.6       8.2      13.3      36.0       2.6
C S 2 1   25       2.9       7.3        .0      13.7      33.8       2.8
C S 2 0   50       2.0       7.4       5.6       8.2      46.2       3.2
C S 2 0   50       2.4       6.4       5.1       8.9      44.6       3.6
C S 2 0   50       1.8       8.0       5.6       7.3      47.1       4.1
C S 2 1   50       2.2       7.3       5.5       8.1      49.3       2.2
C S 2 1   50       2.1       6.8       5.2       8.1      48.7       3.0
C S 2 1   50        .0       7.8       5.5       8.0      47.2       3.7
C S 2 0   85        .0       9.0       7.1      15.2      45.0       2.8
C S 2 0   85       2.0       9.8       6.7      14.5      49.2       1.6
C S 2 0   85        .0       9.0       6.7      14.6      50.2       3.1
C S 2 1   85       2.2       7.7       6.2      16.0      50.0       2.0
C S 2 1   85       2.0       8.8       6.7      13.9      48.1       2.5
C S 2 1   85       2.0      10.1       7.7      13.8      47.6       1.4
C S 2 0  125       2.7       6.5       6.8      18.0        .0       4.4
C S 2 0  125       2.8        .0       6.9      18.4      44.8       2.5
C S 2 0  125       2.7       6.5       7.0      17.6      42.1       2.9
C S 2 1  125       2.5       7.0       6.6      15.8      45.7       5.3
C S 2 1  125       2.8       6.0       5.9      16.8      44.4       4.1
C S 2 1  125       2.8       5.9       5.9      18.7      45.0       2.6
H B 2 1    0       1.8       2.8       2.7       6.4      11.1       5.0
H B 2 1    0       2.1       3.0       2.8        .0      12.6       5.4
H B 2 1    0       2.0       2.8       2.6       7.0      10.0       5.4
H B 2 0    1   *******       2.0       2.9       6.5      11.7       4.7
H B 2 0    1       1.8       2.2       2.8       6.2      11.4       4.7
H B 2 0    1       1.5       2.2       2.7       5.8      11.2       5.0
H B 2 1    1       1.4       1.4       2.4       5.6       7.6       4.2
H B 2 1    1       1.4       1.8       2.6       5.5       9.2       4.2
H B 2 1    1       1.6       1.4       2.5       6.0       9.0       4.6
H B 2 0    5       1.2       2.6       2.9       6.0      11.4       4.2
H B 2 0    5        .1       3.8       3.2       6.2      11.6       4.5
H B 2 0    5   *******       3.9       3.0   *******      10.7       4.3
H B 2 1    5       1.5       4.8       3.2        .0      11.5       4.6
H B 2 1    5       1.6       4.9       3.2       7.5      13.6       4.2
H B 2 1    5       1.3       4.5       3.0       6.9       9.9       3.5
H B 2 0   25        .4       5.7       9.7       1.3        .0      10.0
H B 2 0   25        .8       4.5       2.8       5.0      10.4       8.9
H B 2 0   25        .7       5.1       2.8       4.7      11.4       8.4
H B 2 1   25        .7       3.0       2.5       3.5      12.7       6.4
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                SORTED DATA       12
H B 2 1  25      .4    12.7     5.7     6.5  -999.9     9.9
H B 2 1  25      .3    11.8     4.6     5.2  -999.9     7.1
H B 1 0  50      .8     4.6     4.9     5.4     8.2     9.4
H B 2 0  50     1.1     4.7     4.3     5.9    11.7     6.7
H B 2 1  50      .8     3.5     3.7     5.4    13.8     5.7
H B 2 1  50     1.0     4.1     4.3     6.0    24.3     6.7
H B 2 1  50      .9     3.9     4.7     6.5    15.6     7.1
H B 2 0  85 *******     5.2     3.6     6.2    13.7     7.2
H B 2 0  85      .8     6.0     3.8     6.3    13.6     7.0
H B 2 0  85      .7     4.9     3.2     6.0    13.4     5.9
H B 2 1  85      .7      .5     2.7     6.6    12.8     7.1
H B 2 1  85      .7     6.0     3.2     6.6    13.9     6.8
H B 2 1  85      .7     5.4     3.1     6.6    13.7     6.1
H B 2 0 125      .8     8.0     5.1    11.6     7.2    22.5
H B 2 0 125      .8     9.2     5.1    11.1     7.2    17.2
H B 2 0 125      .8     9.7     5.1    11.1     7.2    18.3
H B 2 1 125      .6     1.2     2.6     5.7     7.2     7.2
H B 2 1 125      .6      .8     2.5     5.8     4.2    15.3
H B 2 1 125      .6     1.5     2.6     6.7     4.7     7.2
H I 2 1   0     3.1    15.0     7.6    20.5    30.3    28.0
H I 2 1   0     3.0    13.6     7.6    20.0    26.7    26.2
H I 2 1   0     3.3    14.4     7.6    19.4    23.3    26.7
H I 2 0   1     1.5     7.4     5.4    26.7     9.5    39.9
H I 2 0   1     1.5     7.2     5.5    25.6     8.9    39.3
H I 2 0   1     1.5     7.0     5.2    25.0     9.6    39.3
H I 2 1   1     1.6    19.7     8.5     6.8     9.2    43.8
H I 2 1   1     1.8    21.7     9.2     6.4     9.5    48.2
H I 2 1   1     1.7    21.6     9.0     6.2     9.5    48.9
H I 2 0   5     1.6    36.2    13.8    74.2    17.2    56.1
H I 2 0   5     1.4    37.9    13.6    72.6    15.0    51.9
H I 2 0   5     1.6    41.0    14.6    79.2    15.6    65.6
H I 2 1   5     1.4    46.3    16.3    36.2    13.1    45.8
H I 2 1   5     1.3    46.6    16.8    36.2    12.5    48.9
H I 2 1   5     1.7    45.6    16.7    40.0    15.8    47.0
H I 2 0  25      .9    44.7    14.9    32.3    25.2    47.5
H I 2 0  25      .9    45.3    14.5    33.8    23.6      .0
H I 2 1  25     1.0    32.4     9.7    29.3  -999.9    40.0
H I 2 1  25     4.0    34.7    10.2    30.9    13.5    41.5
H I 2 1  25     1.0    35.3    10.4      .0    14.7    44.1
H I 2 0  50     1.0    84.2    19.0    65.9    12.4    35.1
H I 2 0  50      .9    82.6    18.9    63.4    10.4    40.0
H I 2 0  50      .8    89.7    22.9    78.7    10.1    40.3
H I 2 1  50      .8    44.0    15.0    27.1     8.2    29.8
H I 2 1  50      .8    46.0    15.5    28.5     6.4    27.9
H I 2 1  50      .9    42.8    14.2    26.9     8.2    28.6
H I 2 0  85     1.4    94.6    23.6     4.1    49.9    67.7
H I 2 0  85     1.4    93.2    23.8    40.2    48.3    64.1
H I 2 0  85     1.4    89.1    23.9    39.8    46.4    62.2
H I 2 1  85      .9    75.7    14.0    34.3    15.8    40.5
H I 2 1  85      .8    78.6    13.1    36.2    16.6    45.2
H I 2 1  85     1.0    78.8    13.2    36.7    17.0    39.6
H I 2 0 125      .8    50.5    12.8    36.3    15.5    50.0
```
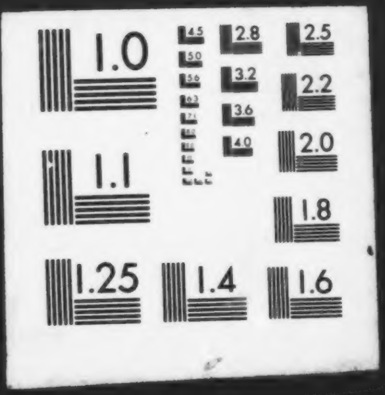

2 OF 2

PB

281 187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3.6
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2.2
2.0
1.1
1.8
1.25
1.4
1.6

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                SORTED DATA       13
M I 2 0 125        .8      50.1      12.6      34.8      13.6      49.7
M I 2 0 125        .8      52.9      13.6      35.8      13.5      51.5
M I 2 1 125       1.2      28.2       9.7        .0       6.9      41.6
M I 2 1 125       1.0      34.4      10.8      21.2       7.2      37.8
M I 2 1 125       1.0      28.4       9.1      19.5       7.2      40.3
M B 2 1   0        .3       6.9       4.7       9.1       2.1       2.7
M B 2 1   0        .2       6.8       6.1       9.8    -999.9       2.8
M B 2 1   0        .3       6.9       4.6      10.2    -999.9       2.9
M B 2 0   5        .4       6.7       5.7       9.9    -999.9       4.2
M B 2 0   5        .4       5.4       5.0       8.9       4.4       3.8
M B 2 0   5        .4       6.7       5.2       8.6       2.9       4.2
M B 2 1   5        .6      10.6       5.9       7.3    -999.9       5.2
M B 2 1   5       1.4       3.1       3.2       5.3       8.5       4.4
M B 2 1   5       1.7       3.0       3.0       6.6       9.8       7.2
M B 2 0  50        .1       5.0       4.1       3.3    -999.9       4.2
M B 2 0  50        .1       4.8       5.2       3.5    -999.9        .0
M B 2 0  50        .2       4.7       4.3       3.6    -999.9       2.7
M B 2 1  50        .2       4.5       4.8       3.7    -999.9       4.3
M B 2 1  50        .1       4.5       5.4       3.4    -999.9       2.7
M B 2 1  50        .2       4.5       5.4       3.8    -999.9        .0
M B 2 0 125        .3       6.8       5.1       4.3    -999.9       3.7
M B 2 0 125        .2       7.1       3.8       3.8    -999.9       2.8
M B 2 0 125        .3       7.3       3.8       4.3    -999.9       4.4
M B 2 1 125        .4       6.6       4.2       6.1    -999.9       4.5
M B 2 1 125        .3       6.5       4.1       5.3    -999.9       5.0
M B 2 1 125        .3       6.7       4.1       4.8    -999.9       4.9
M G 2 1   0        .3       2.5       4.7       4.8       5.0       5.0
M G 2 1   0        .4       2.5       5.4       4.3       5.9       4.7
M G 2 1   0        .5       1.8       5.3       4.9    -999.9       4.9
M G 2 0   5        .5       6.8       8.2      11.3       7.6       7.7
M G 2 0   5        .6       8.9       7.9      14.6       6.3       8.9
M G 2 1   5        .8      10.0       6.6       5.6    -999.9      10.8
M G 2 1   5        .7      10.5       7.3        .0    -999.9      16.5
M G 2 1   5        .6       8.7       6.6       6.0    -999.9      16.2
M G 2 0  50        .1       2.0       6.6       2.2    -999.9       4.8
M G 2 0  50        .1       2.0       6.9       3.2    -999.9       4.6
M G 2 0  50        .2       1.6       5.9       2.4    -999.9       3.5
M G 2 1  50        .1       1.6       7.4       2.9    -999.9       5.6
M G 2 1  50        .1       1.1       7.8       3.2    -999.9       4.7
M G 2 1  50        .2       1.9       7.2       2.5    -999.9       5.3
M G 2 0 125        .4       4.0       9.1       4.0       9.2       7.1
M G 2 0 125        .4       3.6       8.4       3.9    -999.9       8.4
M G 2 0 125        .4       3.3       7.1       4.5        .0       7.8
M G 2 1 125        .4       3.8       7.8       4.6    -999.9       9.5
M G 2 1 125        .5       3.5       4.0       4.2    -999.9       7.7
M G 2 1 125        .2       2.7       6.2       3.8    -999.9      10.4
M L 2 1   0        .4       3.3       6.3       5.9       4.9      16.2
M L 2 1   0        .4       3.2       5.4       5.9       3.4      17.2
M L 2 1   0        .3       2.9       5.9       5.8    -999.9      14.0
M L 2 0   5        .7       2.2      13.2       5.6       4.0      10.1
M L 2 0   5        .6       2.0      12.1       7.9       7.9      10.9
M L 2 0   5        .9       2.1      10.2       6.3       4.5       9.3
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                SORTED DATA      14
M L 2 1   5      1.0    12.5      8.7      8.2  -999.9    11.0
M L 2 1   5       .6     7.8      6.4      6.3  -999.9    13.4
M L 2 0  50       .1     1.4      8.9      2.7  -999.9    10.9
M L 2 0  50   -999.9     2.1      9.7      2.6  -999.9    14.2
M L 2 0  50   -999.9     2.0      9.2      2.7  -999.9     8.1
M L 2 1  50       .1     1.6      7.8      2.4  -999.9    10.9
M L 2 1  50       .1     1.1      7.5      2.2     2.2     8.9
M L 2 1  50       .1     2.0      7.4      2.8     6.1     8.7
M L 2 0 125       .3     2.2      8.7      2.4  -999.9     7.3
M L 2 0 125       .4     2.1      8.6      2.4     4.0     7.8
M L 2 0 125       .4     1.4      9.1      2.5  -999.9     7.6
M L 2 1 125       .4     3.6      9.2      4.5  -999.9    16.1
M L 2 1 125       .5     3.7     10.1      4.8  -999.9    11.5
M L 2 1 125       .5     3.5      9.1      5.0  -999.9    11.2
M R 2 1   0       .0    26.4     10.2     31.3     4.1      .0
M R 2 1   0       .6    26.6     10.6     33.6     4.7    25.0
M R 2 1   0      1.0    20.1     10.3     32.8     3.9    20.2
M R 2 0   5       .6    17.7     10.0     26.4     4.6    20.7
M R 2 0   5       .5    17.3      9.9     27.2     5.0    21.3
M R 2 0   5       .5    17.7      9.6     26.3     5.6    20.7
M R 2 1   5      1.0    17.4      9.7     16.4  -999.9    17.0
M R 2 1   5      1.0    15.5      6.3     17.4     3.9    17.1
M R 2 0  50       .3    18.3     10.4     11.2  -999.9    16.7
M R 2 0  50       .3    15.3      9.7      9.5     4.6    15.6
M R 2 0  50       .4    17.0     10.7     10.7     2.8      .0
M R 2 1  50       .3     8.2      5.8      4.4     1.0    13.0
M R 2 1  50       .3     7.6      6.0      4.8     9.9    12.8
M R 2 1  50       .4     7.4      5.8      4.2     4.8    11.5
M R 2 0 125       .7    30.5      6.9     14.1     7.3    20.5
M R 2 0   0       .0    30.2      6.6  *******     7.2    20.3
M R 2 0 125       .7    30.9      8.0     14.3     7.4    26.2
M R 2 1 125       .6     6.8      6.0     11.9  -999.9    17.5
M R 2 1 125       .8     7.3      6.0     12.6  -999.9    20.2
M R 2 1 125      1.0     7.5      6.4     13.8     4.1    18.5
N I 2 1   0      4.5     6.4     48.9     11.2    15.6   159.6
N I 2 1   0      3.6     6.2     38.6     10.4    16.3   113.6
N I 2 1   0      3.3     6.1     49.2     12.0    15.8   170.7
N I 2 0   1      1.4     3.3     11.3      7.3     7.9   112.2
N I 2 1   1      1.6     3.1      9.6      8.7     9.3   128.1
N I 2 0   5      1.8     2.6     53.6      9.0     7.0   127.5
N I 2 1   5      1.8     1.6     61.9      6.5     8.8   176.3
N I 2 0  25      1.9     2.7     43.3      6.0     7.7   132.7
N I 2 1  25      1.7     2.9     49.0      5.8     8.2   176.7
N I 2 0  50      4.4     5.2     67.8     15.7    18.3   193.8
N I 2 1  50      2.3     7.4     64.8     13.8    10.6   107.4
N I 2 0  85      2.6     4.8    100.9      7.8     8.7   120.6
N I 2 1  85      1.5    10.0     74.9     11.9     8.5   142.8
N I 2 0 125      3.8     6.3     57.7     10.3    11.6   123.2
N S 2 1   0      4.2     7.0      6.7     13.0    36.4     5.1
N S 2 1   0      3.8     8.8      7.4     11.6    35.8     5.0
N S 2 1   0      3.3     7.8      7.3     11.7    35.8     4.8
N S 2 0   1      3.0     7.3      7.9     11.9    33.8     4.9
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                SORTED DATA      15
N S 2 0   1      3.0      7.9      8.7     11.9     36.7      7.6
N S 2 0   1      3.0      8.6      8.3     11.4     37.0      4.8
N S 2 1   1      3.5      7.8      8.1     13.6     37.1      4.3
N S 2 1   1      3.9      9.9      8.2     13.8     37.5      7.3
N S 2 1   1      3.0      7.8      8.4     11.6     34.9      4.8
N S 2 0   5      4.0      7.2      6.3     13.4     34.0      4.2
N S 2 0   5      3.8      6.2      6.2     11.6     35.6      5.1
N S 2 0   5      3.8      5.7      6.0     13.2     34.0      4.0
N S 2 1   5      3.7      7.8      7.1     10.7     35.7      3.6
N S 2 1   5      4.5      6.8      6.4     13.6     34.0      5.0
N S 2 1   5      3.7      6.6      6.4     12.3     31.1      4.8
N S 2 0  25      3.0      7.6      8.6     11.0     32.1      4.6
N S 2 0  25      3.3      7.4      8.1     12.0     34.3      4.4
N S 2 0  25      3.2      7.9      8.4     11.0     31.5      4.0
N S 2 1  25      3.1      9.0      8.5     10.8     32.4      4.0
N S 2 1  25      2.8      7.7      8.0     11.1     33.4      4.2
N S 2 1  25      3.6      8.9      8.4     12.5     33.9      5.1
N S 2 0  50      5.0      8.3     10.2     14.4     48.2      4.6
N S 2 0  50      5.3      7.7     10.2     14.9     49.2      4.1
N S 2 0  50      5.1      8.6     10.3     13.6     48.7      4.7
N S 2 1  50      5.4      7.0      9.3     16.2     46.7      4.7
N S 2 1  50      5.2      8.0      9.7     15.3     45.9      4.2
N S 2 1  50      5.0      8.6     10.7     14.6     46.9      4.8
N S 2 0  85      2.2      8.8      9.4     13.4     50.9      3.0
N S 2 0  85      2.2      9.3      9.1     13.6     50.6      3.2
N S 2 0  85      2.3      9.5      9.3     13.7     50.0      3.7
N S 2 1  85      2.4      8.6      8.9     14.1     45.4      3.8
N S 2 1  85      2.3      9.5      9.9     13.6     49.3      5.5
N S 2 1  85      2.3      8.7      9.4     13.5     52.1      3.9
N S 2 0 125      2.4      9.5      8.0     12.2     39.3      4.4
N S 2 0 125      2.4      9.7      7.8     12.6     45.5      5.1
N S 2 0 125      2.5      9.7      8.2     13.2     43.7      4.9
O I 2 1   0      1.7     10.8     88.8     18.9      4.9    563.4
O I 2 1   0      1.8      9.8     85.5     17.9      6.0    825.5
O I 2 1   0      1.8     10.6     91.5     20.9     10.8    583.2
O I 2 0   1      5.0      6.3    161.6     12.9     14.8    933.8
O I 2 0   1      5.0      6.1    152.7     12.1     11.3    913.0
O I 2 0   1      4.7      5.3    162.0     11.9     11.3    915.6
O I 2 1   1      2.7      9.5     93.5     20.5      9.6    513.0
O I 2 1   1      2.6     10.2     95.7     21.8      5.9    539.3
O I 2 1   1      3.1     17.6     68.2     33.4      7.2    433.6
O I 2 0   5      4.6     11.6    157.1     20.2      8.9    676.1
O I 2 0   5      4.7     14.3    137.1     23.8     10.5    609.3
O I 2 1   5      3.6      9.3     99.7     17.4      8.2    491.7
O I 2 1   5      3.8     11.3     98.7     20.6     10.0    568.7
O I 2 0  25      5.6     18.5    214.9     20.7     13.1    816.8
O I 2 0  25      5.3     19.5    217.5     24.8     16.5    839.8
O I 2 0  25      6.8     25.7    238.4     33.8     14.3    997.7
O I 2 1  25      3.7     13.6    146.0     17.0     11.2    761.8
O I 2 1  25      4.4     15.1    155.6     19.7      9.1    713.8
O I 2 1  25      3.9     17.2    137.6     17.2      4.7    662.2
O I 2 0  50      3.8     29.8    214.2     25.9     10.9    842.4
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                SORTED DATA          16
0 I 2 1  50        3.1     19.7     129.2     17.3      6.4   741.0
0 I 2 1  50        2.0     13.9     119.1     15.6      4.3   678.0
0 I 2 0  85        7.4     18.4     720.8     25.0     23.7  2386.9
0 I 2 1  85        2.8      7.0     299.3     11.0      7.0   735.2
0 I 2 0 125        3.6     24.4     300.1     22.4     16.3  1096.0
0 I 2 0 125        3.3     32.3     372.7     28.4     12.4   961.2
0 I 2 1 125        2.5     17.2     244.5     16.9      5.1   391.5
0 S 2 1   0        3.0      7.3       6.9     17.8     38.6     4.0
0 S 0 1   0        3.1      7.6       6.8     18.6     38.2     3.7
0 S 2 1   0        3.1      7.5       6.8     18.4     37.7     3.1
0 S 2 0   1        3.2     10.2       9.2     17.0     36.9     3.8
0 S 2 0   1        3.1      8.7       7.8     16.8     35.6     4.2
0 S 2 0   1        3.0      8.7       7.4     17.8     35.7     4.1
0 S 2 1   1        2.6     12.5       8.2     20.8     35.3     8.9
0 S 2 1   1        3.3     11.0       8.0     21.5     37.4     9.5
0 S 2 1   1        3.2     11.0       7.8     21.5     37.4    11.8
0 S 2 0   5        3.1     13.2       9.6     18.0     34.0    10.0
0 S 2 0   5        2.6     12.8       9.6     15.9     31.9     9.1
0 S 2 0   5        3.4     12.7       9.6     19.0     35.4     7.0
0 S 2 1   5        3.1     13.4       9.8     18.2     34.5     7.4
0 S 2 1   5        3.1     12.5       9.6     18.3     33.7     5.9
0 S 2 1   5        3.9     13.5      10.2     21.2     35.7     6.8
0 S 2 0  25        3.2     12.7       8.1     14.4     31.4     5.7
0 S 2 0  25        3.2     11.9       7.9     14.3     32.5     5.5
0 S 2 0  25        2.9     12.3       8.4     16.4     37.7     5.9
0 S 2 1  25        2.6     16.4       9.1     20.1     32.0     6.4
0 S 2 1  25        2.8     16.0       9.4     16.0     32.1     6.5
0 S 2 1  25        2.7     14.0       8.6     18.1     42.0     7.2
0 S 2 0  50        1.7     10.4       7.4     12.8     48.1     6.8
0 S 2 0  50        1.9      9.5       7.4     13.9     44.8     7.3
0 S 2 0  50        1.9     10.6       7.9     14.1     50.2     7.3
0 S 2 1  50        2.0      9.6       7.5     14.0     47.1     7.4
0 S 2 1  50        1.6     10.3       7.6     12.7     47.8     6.6
0 S 2 1  50        1.8      9.2       7.4     13.4     44.8     6.8
0 S 2 0  85        1.7     12.4      13.0     14.6     48.6    16.8
0 S 2 0  85        1.7     12.5      12.7     14.3     51.0    18.4
0 S 2 0  85        1.5     13.7      13.6     15.2     51.1    20.2
0 S 2 1  85        1.7     11.0      10.3     13.0     51.0    15.3
0 S 2 1  85        1.8     12.1      11.2     14.7     50.2    15.3
0 S 2 1  85        1.9     12.8      11.3     15.8     51.6    16.5
0 S 2 0 125        2.3     24.1      10.4     25.0     45.2    16.5
0 S 2 0 125        2.3     25.6      11.1     23.6     41.3    17.1
0 S 2 0 125        2.4     23.3       9.6     23.8     34.7    16.4
0 S 2 1 125        2.4     21.0       9.9     20.8     37.6    11.6
0 S 2 1 125        2.3     21.9       9.7     20.8     35.6    10.4
0 S 2 1 125        2.4     21.0       9.7     21.7     44.4    10.6
P D 2 0  25        1.8    438.5      47.8    338.0     35.2    74.3
P D 2 0  25        1.8    397.4      48.3    318.8     36.5    72.9
P D 2 0  25        1.9    499.8      51.3    354.5     39.5    79.3
P D 2 1  25        1.6    379.3      52.2    262.5     15.0    70.0
P D 2 1  25        1.5    383.5      49.8    288.6     12.0    80.0
P D 2 1  25        1.5    376.7      55.2    296.7     13.0    86.2
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                  SORTED DATA      17
P D 2 0  50      2.0    498.0     55.9    327.7     44.0      88.9
P D 2 0  50      2.0    532.3     55.4    357.1     45.6      86.1
P D 2 0  50      2.3    539.0     58.8    361.6       .0      75.0
P D 2 1  50      1.4    429.6     50.8    284.0     10.6      75.3
P D 2 1  50      1.6    437.0     64.1    293.1     10.7      90.1
P D 2 1  50      1.8    425.1     60.2    300.0     13.8      73.8
P D 2 0  85      1.9    375.9     86.5    270.5     83.5      83.1
P D 2 0  85      1.9    395.3     86.1    267.0     81.2      82.8
P D 2 0  85      1.9    390.1     85.6    266.7     82.1      85.0
P D 2 1  85      2.3    270.4     76.2    235.4     29.7      47.9
P D 2 1  85      1.7    188.5     69.3    214.0     29.9      43.9
P D 2 1  85      1.8    232.5     79.3    242.2     30.8      51.4
P D 2 1 125      1.9    218.2     46.3    226.5     20.8      62.3
P D 2 1 125      2.0    204.1     44.7    225.5     19.4      57.7
P D 2 1 125      1.9    229.9     47.8    231.0     19.9      62.4
R   2 0   0    264.6   3287.6   2249.8    364.3     19.6    2446.7
R   2 0   0    118.9   3774.8   2748.8    373.2     25.2    2648.2
R   2 0   0    114.4   3938.2   2337.4    389.3     19.4    2427.9
R   2 0   1     57.7   1449.5   1310.5    276.6     19.8    1151.2
R   2 0   1     50.6   1374.4   1230.9    244.6     26.4    1065.0
R   2 0   1     66.7   1878.8   1581.8    317.0     16.9    1365.2
R   2 0   5     63.3   2022.2    994.6    328.7     22.9    1463.1
R   2 0   5     53.3   1763.2   1058.4    307.0     16.9     944.0
R   2 0   5     60.3   2152.9    995.5    337.5     14.7    1377.6
R   2 0  25     56.4   1993.1   1185.6    254.0     49.3    1378.7
R   2 0  25     45.5   1492.6   1652.7    224.3     32.5     933.1
R   2 0  25     52.8   2052.2   1082.1    258.0     20.3    1305.1
R   2 0  50     62.0   2057.0   1445.3    233.7     61.7    1474.0
R   2 0  50     61.4   1815.3   1414.3    215.4     58.7    1360.0
R   2 0  50     76.1   2064.9   1489.3    239.7     51.1    1499.7
R   2 0  85     40.2   1290.6    888.5    254.4     66.5     914.0
R   2 0  85     30.0   1239.7    873.9    239.6     70.0     879.4
R   2 0  85     23.2   1230.1    891.2    219.4     96.2     778.1
R   2 0 125     16.8    668.1    522.3    139.1     19.9     436.0
R   2 0 125     18.8    653.9    547.2    149.1     19.9     451.6
R   2 0 125     18.3    654.2    438.0    130.5     19.9     406.6
S   2 0   0       .6      6.6      6.7      7.1      6.6      16.2
S   2 0   0       .6      6.8      6.6      7.2      6.6      16.0
S   2 0   0       .6      7.1      7.1      7.5      6.7      16.2
S   2 1   0       .6      7.5      5.7      9.6      7.6      15.9
S   2 1   0       .6      7.1      6.0      9.5      7.6      16.3
S   2 1   0       .6      6.9      5.8      9.0      8.0      16.4
S   2 0   1       .6      6.0      6.4      6.2      7.2      15.0
S   2 0   1       .6      5.5      6.3      6.1      6.7      15.0
S   2 0   1       .5      5.6      6.4      6.1      6.9      15.6
S   2 1   1       .6      7.0      6.7      8.2      6.7      16.9
S   2 1   1       .5      6.8      7.4      5.4      6.8      15.6
S   2 1   1       .6      7.1      6.5      5.3      6.5      15.3
S   2 0   5       .3      5.2      6.3      4.3      5.0      12.0
S   2 0   5       .3      5.9      7.1      4.0      5.5      13.6
S   2 0   5       .2      5.9      6.2      4.6      5.2      16.4
S   2 1   5       .3      6.8      6.4      6.6      6.9      12.7
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                SORTED DATA       18
S     2 1   5       .4      8.0       7.0       6.6       7.5      14.8
S     2 1   5       .2      5.4       5.0       4.7       5.2      13.9
S     2 0  25       .5      7.5       9.6       7.4       7.6      15.3
S     2 0  25       .4      6.7       8.9       6.7       6.5      14.5
S     2 0  25       .5      6.7       8.9       7.1       6.7      13.7
S     2 1  25       .4      7.5      10.0       8.9       6.6      15.5
S     2 1  25       .5      7.8       9.6       8.8       6.8      15.3
S     2 1  25       .5      8.3       9.8       8.9       7.3      16.9
S     2 0  50       .3      7.1       8.7       7.7       5.5      16.0
S     2 0  50       .3      6.5       8.6       7.5       5.1      15.2
S     2 0  50       .3      7.3       9.5       8.7       6.0      18.6
S     2 1  50       .6      7.3       8.9       7.5       5.3      14.1
S     2 1  50       .3      6.3       7.8       7.1       4.5      10.9
S     2 1  50       .3      6.1       7.8       7.3       4.9      11.2
S     2 0  85       .2     43.6       8.0       8.1       7.1      15.4
S     2 0  85       .2     39.4       7.6       7.6       6.8      15.1
S     2 0  85       .3     43.5       8.0       8.4       7.7      14.9
S     2 1  85       .2     42.7       7.6       8.2       6.8      16.3
S     2 1  85       .2     41.6       7.3       8.0       6.4      15.5
S     2 1  85       .3     43.7       7.6       8.8       7.1      14.6
S     2 0 125       .4     54.2       8.4      11.8       8.5      18.2
S     2 0 125       .4     54.2       8.6      11.1       8.1      17.4
S     2 0 125       .3     52.0       8.6      10.9       7.9      17.0
S     2 1 125       .4     54.0       7.8      10.5       7.3      16.1
S     2 1 125       .4     50.2       7.2      10.1       7.1      15.0
S     2 1 125       .3     51.8       7.6      10.5       7.1      15.2
T L 2 1     0      1.2     16.6       7.8      30.7       9.7      28.3
T L 2 1     0      1.1     16.3       7.4      28.1       9.7      26.6
T L 2 1     0      1.0     15.5       7.5      29.4      10.8      28.0
T L 2 0     1      2.1     16.4      10.4      24.0      12.5      25.2
T L 2 0     1      1.5     15.8      11.6      24.6      11.6      26.9
T L 2 0     1      1.5     14.2      10.6      24.0      12.5      25.4
T L 2 1     1      1.6     12.4      10.2      21.2       7.1      28.0
T L 2 1     1      1.3     13.9      10.1      20.2       6.1      24.4
T L 2 0     5      2.2     51.0      18.6      55.2      12.4      34.9
T L 2 0     5      1.9     49.6      18.5      55.4      14.6      40.1
T L 2 0     5      2.8     59.3      19.8      59.3      15.8      37.0
T L 2 1     5      1.9     37.5      15.0      40.9      10.2      39.3
T L 2 1     5      2.0     41.0      15.3      42.9       9.3      36.9
T L 2 1     5      2.3     39.3      15.4      42.9       8.9      33.4
T L 2 0    25      4.1     32.2      19.7      28.6       8.8      23.6
T L 2 0    25      4.3     31.8      20.6      30.4       6.9      22.8
T L 2 1    25      3.6     37.5      22.4      42.0    -999.9      33.0
T L 2 1    25      3.8     37.1      22.8      41.5    -999.9      32.6
T L 2 1    25      3.5     37.5      22.5      41.7    -999.9      30.6
T L 2 0    50      5.1     35.4      26.9      23.5      13.1      41.8
T L 2 0    50      5.9     38.8      30.4      27.5      13.4      45.7
T L 2 0    50      6.4     44.4      34.5      30.3      14.8      53.7
T L 2 1    50      2.7     57.4      24.8      44.1       9.5      39.2
T L 2 1    50      2.7     58.5      24.9      44.2       9.8      41.4
T L 2 1    50      2.7     51.9      25.0      44.4      11.0      40.5
T L 2 0    85      3.4    116.9      29.3      73.6       6.3      31.3
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                    SORTED DATA       19
 T L 2 0  85          3.6    128.4       29.1      73.4       6.8      31.6
 T L 2 0  85          3.4    129.3       29.1      74.0       6.7      32.5
 T L 2 1  85          2.5     43.1       22.4      29.3       6.3      20.6
 T L 2 1  85          2.7     49.5       23.8      32.0       6.3      27.0
 T L 2 1  85          2.7     42.4       24.0      31.0       6.8      27.2
 T L 2 0 125          3.5     73.2       29.6      36.6    -999.9      15.0
 T L 2 1 125          1.2     52.6       15.4      29.4    -999.9      12.5
 T L 2 1 125          1.2     48.9       14.2      28.5    -999.9      10.7
 T L 2 1 125          1.2     52.2       15.6      29.2    -999.9      11.9
 T R 2 1   0          1.3     19.0        7.6      27.6       9.3      34.7
 T R 2 1   0          1.1     16.7        6.8      25.9      11.9      35.0
 T R 2 1   0          1.2     17.7        7.2      25.9       9.2      35.1
 T R 2 0   1          1.2     24.8       10.6      33.6      15.4      38.1
 T R 2 0   1          1.3     25.4       11.8      33.5      16.8      42.3
 T R 2 0   1          1.2     22.8        9.2      31.3      15.7      41.6
 T R 2 1   1          1.2     23.6       10.9      29.7       8.9      42.5
 T R 2 1   1           .9     20.3        9.2      24.7       8.1      37.3
 T R 2 1   1          1.1     22.4       10.3      29.5       7.9      42.4
 T R 2 0   5          1.1     72.2       22.2      77.7      16.6      50.4
 T R 2 0   5          1.1     72.0       21.8      76.1      15.5      49.6
 T R 2 0   5          1.1     68.3       19.9      72.6      18.5      48.6
 T R 2 1   5          1.0     33.0       10.3      34.0       8.2      44.2
 T R 2 1   5          1.0     32.2       10.0      34.3       7.8      43.2
 T R 2 1   5          1.2     32.8       10.6      31.8       9.3      42.5
 T R 2 0  25          1.4     42.0       14.2      38.9       7.8      41.1
 T R 2 0  25          1.5     38.2       13.4      35.2       7.6      40.4
 T R 2 0  25          1.5     38.7       13.0      35.9      10.2      37.9
 T R 2 1  25          1.1     41.7       14.5      40.8       8.7      28.8
 T R 2 1  25          1.0     41.0       14.2      40.0       8.6      32.5
 T R 2 1  25          1.0     43.0       15.0      44.9       8.4      32.0
 T R 2 0  50          1.5     50.9       18.0      33.8      17.3      49.7
 T R 2 0  50          1.2     51.1       18.0      34.5      18.3      56.2
 T R 2 0  50          1.4     52.8       17.9      33.9      18.6      51.7
 T R 2 1  50          1.2     46.4       16.4      35.4       9.9      42.4
 T R 2 1  50          1.4     44.4       16.0      36.0      10.8      43.4
 T R 2 1  50          1.1     43.7       15.7      34.2      12.6      38.4
 T R 2 0  85          1.7     89.8       20.6      53.0       9.9      43.1
 T R 2 0  85          1.5     90.4       18.0      50.2       9.6      41.4
 T R 2 0  85          1.7     94.9       20.3      43.5       9.4      43.1
 T R 2 1  85          1.9     73.2       19.8      54.0       6.9      32.9
 T R 2 1  85          1.8     68.0       20.7      53.3       6.5      31.4
 T R 2 1  85          1.9       .0       19.8      54.0       9.9      41.4
 T R 2 0 125          1.8     78.0       18.3      36.0       3.3      33.0
 T R 2 0 125          1.8     75.8       17.8      35.5       3.3      32.9
 T R 2 0 125          1.9     80.4       18.7      37.2       2.9      32.3
 T R 2 1 125          1.6     60.6       14.1      37.2       7.1      21.3
 T R 2 1 125          1.8     68.6       15.2      40.0       7.7      21.8
 T R 2 1 125          1.6     67.0       20.7        .0       7.8      19.2
 U I 2 1   0          2.1      7.2        6.7      15.6      20.2      24.3
 U I 2 1   0          2.2      7.3        6.5      16.0      17.8      27.9
 U I 2 1   0          2.2      7.6        6.5      16.5      17.4      29.8
 U I 2 0   1          2.0      8.9        7.8      20.1      18.2      24.1
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                SORTED DATA      20
U I 2 0   1      1.9      8.9      7.5     20.0     21.8     22.0
U I 2 0   1      2.0      9.0      7.3     20.2     20.2     27.2
U I 2 1   1      2.0      8.2      7.4     19.6     18.7     26.8
U I 2 1   1      2.0      8.0      7.2     18.3     17.4     26.1
U I 2 1   1      2.1      7.8      7.1     18.7     16.9     27.5
U I 2 0   5      1.8     17.3     10.9     40.5     18.4     39.5
U I 2 0   5      1.7     18.9     11.6     38.8     17.9     44.9
U I 2 0   5      1.8     19.9     11.5     38.2     18.2     45.2
U I 2 1   5      2.1     14.8      9.1     30.9     13.5     34.0
U I 2 1   5      2.1     14.9      9.4     32.0     15.0     36.2
U I 2 1   5      2.2     15.0      9.4     32.4     11.8     35.7
U I 2 0  25      1.4     35.0     14.5     57.5     25.4     41.3
U I 2 0  25      1.5     39.4     14.7     54.8     26.9     39.4
U I 2 0  25      1.4     40.6     16.0     64.2     26.8     43.5
U I 2 1  25      1.7     22.5     10.7     28.9     22.5     30.3
U I 2 1  25      1.6     15.4     11.3     29.6     23.1     31.7
U I 2 1  25      1.7     14.3     11.6     29.5     20.3     31.6
U I 2 0  50      2.2     13.9     11.5     17.1     24.5     24.5
U I 2 0  50      2.2     13.3     10.7     15.6     23.4     30.7
U I 2 0  50      2.2     14.5     10.8     16.0     22.5     26.9
U I 2 1  50      2.1     15.8     11.8     19.4     23.7     35.1
U I 2 1  50      2.2     15.4     11.6     20.2     23.0     32.1
U I 2 1  50      2.2     14.4     11.7     18.7     24.3     28.1
U I 2 0  85      2.3     71.2     15.6     48.6     19.3     42.5
U I 2 0  85      2.4     70.3     15.6     46.9     20.9     42.6
U I 2 0  85      2.4     70.8     15.2     47.0     20.7     42.5
U I 2 1  85      2.2     27.0      9.5     20.4     13.7     41.0
U I 2 1  85      2.2     28.8     11.0     21.2     14.7     42.2
U I 2 1  85      2.2     29.5     11.0     23.2     15.8     42.2
U I 2 0 125      2.3     26.6     20.4     31.6     44.0     50.2
U I 2 0 125      2.4     29.6     21.1     36.7     49.7     56.3
U I 2 0 125      2.4     28.6     20.9     35.3     47.0     57.6
U I 2 1 125      2.1     17.6      9.7     31.6     20.7     39.4
U I 2 1 125      2.1     17.7      9.3     29.8     24.8     33.4
U I 2 1 125      1.9     17.6     10.5     30.7     23.8     35.3
U S 2 1   0      2.8      5.2      6.0     12.5     30.8      4.3
U S 2 1   0      2.9      5.7      6.0     13.9     31.7      4.4
U S 2 1   0      3.1      4.2      4.8     16.5     33.0      4.4
U S 2 0   1      3.1      5.2      5.3     13.9     29.7      5.2
U S 2 0   1      2.9      5.6      5.1     15.4     31.7      5.0
U S 2 0   1      2.7      5.6      5.8     14.3     30.3      5.0
U S 2 1   1      2.8      5.5      5.8     15.2     30.4      5.0
U S 2 1   1      2.7      5.3      5.6     14.6     28.2      4.6
U S 2 1   1      2.8      4.9      5.1     14.7     26.7      4.2
U S 2 0   5      2.4      5.3      5.9     13.4     26.8     19.4
U S 2 0   5      3.3      4.8      5.8     14.0     28.9     20.0
U S 2 0   5      2.7      4.9      6.0     12.7     29.6     20.5
U S 2 1   5      2.7      5.4      5.6     14.0     30.8     15.4
U S 2 1   5      2.4      4.5      5.0     14.0     29.8     15.4
U S 2 1   5      2.9      5.3      4.9     13.7     29.2     16.0
U S 2 0  25      1.9      7.3      5.1      8.1     47.6      9.0
U S 2 0  25      2.6      7.5      5.3      9.3     48.0      8.8
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                 SORTED DATA      21
U S 2 0   25        1.9       8.0       5.2       8.2      49.3       9.8
U S 2 1   25        1.9       7.6       5.4      10.9      48.6       9.3
U S 2 1   25        2.1       7.1       4.9       9.5      42.3       9.4
U S 2 1   25        2.1       7.0       5.3       8.9      49.4       9.3
U S 2 0   50        2.6       5.1       6.8       9.8      38.8      11.8
U S 2 0   50        2.9       4.7       6.7      11.8      40.6      13.4
U S 2 0   50        2.5       5.9       7.0      10.2      40.1      15.1
U S 2 1   50        2.8       5.8       6.9      11.5      39.5      14.0
U S 2 1   50        2.7       6.1       7.8      10.[illegible]      44.1      14.1
U S 2 1   50        2.6       4.9       7.5      10.7      35.1      17.1
U S 2 0   85        2.9       8.6       5.0      13.9      45.2      13.8
U S 2 0   85        2.7       8.2       4.8      13.9      43.1      11.0
U S 2 0   85        2.7       7.6       4.5      14.2      40.8      13.6
U S 2 1   85        2.7       9.8       5.4      14.6      43.4       8.4
U S 2 1   85        2.9       9.8       5.7      14.6      47.8      15.0
U S 2 1   85        2.6       8.7       5.0      14.4      40.8       7.7
U S 2 0  125        2.6       6.2       6.0      16.5      39.8      13.9
U S 2 0  125        2.4       7.7       7.0      13.8      41.5      15.2
U S 2 0  125        2.5       6.5       7.0      14.9      38.7      14.2
U S 2 1  125        2.5       6.4       6.1      15.7      39.3      11.9
U S 2 1  125        2.7       6.3       6.8      17.7      39.3      13.0
U S 2 1  125        2.8       4.7       6.0      16.7      32.5       9.3
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APPENDIX B

Results for net uptake for Experiments I and II

A Students t test ($P<0.05$) was calculated for the null hypothesis: Ho: $\mu_1 = \mu_2$ where μ_1 is experimental and μ_2 is control for each metal for each combination of Experiment I or II, at each sample time, with n-2 degrees of freedom shown (Deg). Also shown are the values of E mean- C mean), the individual means and standard deviations.

```
      CLAM          INTERNAL      EXPERIMENT NO=1
           DAY NUMBER    0                                                                                            1
 CADMIUM  T=       2.66 NOT SIGNIFICANT EMEAN-CMEAN=      1.54 DEG=  4 EMEAN=       2.55 EDEV=       .21 CMEAN=      1.01 CDEV=        .76
 CHROMIUM                 EMEAN=CMEAN                                  EMEAN=       1.70  EDEV=     .21  CMEAN=      1.70CDEV=     .00
 COPPER   T=      11.14  SIGNIFICANT      EMEAN-CMEAN=    14.57 DEG=  4 EMEAN=      31.50 EDEV=       .14 CMEAN=     16.92 CDEV=       1.74
 NICKLE   T=       1.98 NOT SIGNIFICANT EMEAN-CMEAN=     -5.04 DEG=  4 EMEAN=        .45 EDEV=       .00 CMEAN=      5.49 CDEV=       3.40
 LEAD     T=       1.95 NOT SIGNIFICANT EMEAN-CMEAN=     -3.66 DEG=  4 EMEAN=        .25 EDEV=       .00 CMEAN=      3.91 CDEV=       2.51
 ZINC     T=       1.41 NOT SIGNIFICANT EMEAN-CMEAN=    -36.15 DEG=  4 EMEAN=      82.00 EDEV=      1.41 CMEAN=    118.15 CDEV=      34.09
           DAY NUMBER    1
 CADMIUM  T=       1.15 NOT SIGNIFICANT EMEAN-CMEAN=     -1.77 DEG=  3 EMEAN=        .40 EDEV=       .43 CMEAN=      2.17 CDEV=       2.86
 CHROMIUM                 EMEAN=CMEAN                                  EMEAN=       1.70  EDEV=     .43  CMEAN=      1.70CDEV=     .00
 COPPER   T=       5.25  SIGNIFICANT      EMEAN-CMEAN=   -15.70 DEG=  3 EMEAN=       6.35 EDEV=      3.39 CMEAN=     24.05 CDEV=       3.0[illegible]
 NICKLE   T=        .77 NOT SIGNIFICANT EMEAN-CMEAN=      2.35 DEG=  3 EMEAN=       2.80 EDEV=      4.07 CMEAN=       .45 CDEV=        .00
 LEAD     T=        .77 NOT SIGNIFICANT EMEAN-CMEAN=      2.08 DEG=  3 EMEAN=       2.33 EDEV=      3.61 CMEAN=       .25 CDEV=        .00
 ZINC     T=       6.43  SIGNIFICANT      EMEAN-CMEAN=  -115.10 DEG=  3 EMEAN=     173.40 EDEV=     15.42 CMEAN=    288.50 CDEV=      26.02
           DAY NUMBER    5
 CADMIUM  T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -1.77 DEG=  2 EMEAN=        .15 EDEV=       .00 CMEAN=      1.92 CDEV=       2.51
 CHROMIUM                 EMEAN=CMEAN                                  EMEAN=       1.70  EDEV=     .00  CMEAN=      1.70CDEV=     .00
 COPPER   T=      11.65  SIGNIFICANT      EMEAN-CMEAN=    -9.55 DEG=  2 EMEAN=      10.55 EDEV=       .92 CMEAN=     20.10 CDEV=        .71
 NICKLE                   EMEAN=CMEAN                                  EMEAN=        .45  EDEV=     .92  CMEAN=       .45CDEV=     .00
 LEAD     T=       6.10  SIGNIFICANT      EMEAN-CMEAN=    11.90 DEG=  2 EMEAN=      12.15 EDEV=      2.76 CMEAN=       .25 CDEV=        .00
 ZINC     T=       1.18 NOT SIGNIFICANT EMEAN-CMEAN=     15.40 DEG=  2 EMEAN=     229.10 EDEV=     18.10 CMEAN=    213.70 CDEV=       3.25
           DAY NUMBER   25
 CADMIUM  T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=       .93 DEG=  2 EMEAN=       2.00 EDEV=       .00 CMEAN=      1.07 CDEV=       1.31
 CHROMIUM                 EMEAN=CMEAN                                  EMEAN=       1.70  EDEV=     .00  CMEAN=      1.70CDEV=     .00
 COPPER   T=       1.65 NOT SIGNIFICANT EMEAN-CMEAN=    -10.25 DEG=  2 EMEAN=      11.05 EDEV=      1.77 CMEAN=     21.30 CDEV=       8.63
 NICKLE   T=        .10 NOT SIGNIFICANT EMEAN-CMEAN=      -.65 DEG=  2 EMEAN=       4.77 EDEV=      6.12 CMEAN=      5.42 CDEV=       7.04
 LEAD     T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -3.17 DEG=  2 EMEAN=        .25 EDEV=       .00 CMEAN=      3.42 CDEV=       4.49
 ZINC     T=      11.00  SIGNIFICANT      EMEAN-CMEAN=    92.40 DEG=  2 EMEAN=     185.90 EDEV=      1.84 CMEAN=     93.50 CDEV=      11.74
           DAY NUMBER   50
 CADMIUM  T=        .82 NOT SIGNIFICANT EMEAN-CMEAN=     -1.00 DEG=  4 EMEAN=       2.37 EDEV=      1.15 CMEAN=      3.37 CDEV=       1.76
 CHROMIUM T=       1.08 NOT SIGNIFICANT EMEAN-CMEAN=      1.43 DEG=  4 EMEAN=       3.73 EDEV=      2.05 CMEAN=      2.30 CDEV=       1.04
 COPPER   T=        .52 NOT SIGNIFICANT EMEAN-CMEAN=      1.38 DEG=  4 EMEAN=       7.88 EDEV=      2.98 CMEAN=      6.50 CDEV=       3.55
 NICKLE   T=       2.37 NOT SIGNIFICANT EMEAN-CMEAN=     -4.33 DEG=  4 EMEAN=       7.33 EDEV=      2.21 CMEAN=     11.67 CDEV=       2.27
 LEAD     T=        .45 NOT SIGNIFICANT EMEAN-CMEAN=     -1.13 DEG=  4 EMEAN=       8.70 EDEV=      2.70 CMEAN=      9.83 CDEV=       3.38
 ZINC     T=       1.78 NOT SIGNIFICANT EMEAN-CMEAN=    -86.67 DEG=  4 EMEAN=     183.13 EDEV=     13.30 CMEAN=    269.80 CDEV=      83.06
           DAY NUMBER  125
 CADMIUM  T=       2.35 NOT SIGNIFICANT EMEAN-CMEAN=      -.32 DEG=  7 EMEAN=       1.46 EDEV=       .13 CMEAN=      1.77 CDEV=        .26
 CHROMIUM T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  7 EMEAN=       1.70 EDEV=       .00 CMEAN=      1.70 CDEV=        .00
 COPPER   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  7 EMEAN=       4.45 EDEV=       .00 CMEAN=      4.45 CDEV=        .00
 NICKLE   T=        .57 NOT SIGNIFICANT EMEAN-CMEAN=      -.95 DEG=  7 EMEAN=       4.68 EDEV=      2.23 CMEAN=      5.62 CDEV=       2.75
 LEAD     T=        .28 NOT SIGNIFICANT EMEAN-CMEAN=       .17 DEG=  7 EMEAN=       5.44 EDEV=       .63 CMEAN=      5.27 CDEV=       1.11
 ZINC     T=        .74 NOT SIGNIFICANT EMEAN-CMEAN=      9.77 DEG=  7 EMEAN=     116.50 EDEV=     14.78 CMEAN=    106.72 CDEV=      24.66
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     CLAM          SHELL          EXPERIMENT NO=1                                                                          2
             DAY NUMBER   0
CADMIUM  T=        .48 NOT SIGNIFICANT EMEAN-CMEAN=       .15 DEG=  6 EMEAN=      3.60 EDEV=       .47 CMEAN=      3.45 CDEV=       .41
CHROMIUM T=       1.20 NOT SIGNIFICANT EMEAN-CMEAN=      1.67 DEG=  5 EMEAN=      3.37 EDEV=      2.89 CMEAN=      1.70 CDEV=       .00
COPPER                     EMEAN=CMEAN                               EMEAN=      4.45  EDEV=    2.89  CMEAN=     4.45CDEV=     .00
NICKLE   T=        .02 NOT SIGNIFICANT EMEAN-CMEAN=      -.25 DEG=  6 EMEAN=     16.90 EDEV=     19.00 CMEAN=     17.15 CDEV=     19.28
LEAD     T=        .11 NOT SIGNIFICANT EMEAN-CMEAN=     -1.80 DEG=  5 EMEAN=     30.20 EDEV=     16.98 CMEAN=     32.00 CDEV=     23.27
ZINC     T=       1.26 NOT SIGNIFICANT EMEAN-CMEAN=     -1.27 DEG=  6 EMEAN=      2.35 EDEV=      1.12 CMEAN=      3.62 CDEV=      1.68
             DAY NUMBER   1
CADMIUM  T=        .88 NCT SIGNIFICANT EMEAN-CMEAN=      1.11 DEG=  6 EMEAN=      2.74 EDEV=      1.86 CMEAN=      1.62 CDEV=      1.70
CHROMIUM T=        .38 NOT SIGNIFICANT EMEAN-CMEAN=       .73 DEG=  6 EMEAN=      5.02 EDEV=      2.32 CMEAN=      4.30 CDEV=      3.00
COPPER                     EMEAN=CMEAN                               EMEAN=      4.45  EDEV=    2.32  CMEAN=     4.45CDEV=     .00
NICKLE   T=        .71 NOT SIGNIFICANT EMEAN-CMEAN=      9.19 DEG=  6 EMEAN=     26.34 EDEV=     17.31 CMEAN=     17.15 CDEV=     19.28
LEAD     T=        .11 NOT SIGNIFICANT EMEAN-CMEAN=      1.88 DEG=  6 EMEAN=     34.42 EDEV=     24.31 CMEAN=     32.55 CDEV=     21.90
ZINC     T=        .88 NOT SIGNIFICANT EMEAN-CMEAN=      1.12 DEG=  5 EMEAN=      3.45 EDEV=      1.68 CMEAN=      2.33 CDEV=      1.62
             DAY NUMBER   5
CADMIUM  T=        .04 NOT SIGNIFICANT EMEAN-CMEAN=       .05 DEG=  6 EMEAN=      1.82 EDEV=      1.94 CMEAN=      1.77 CDEV=      1.88
CHROMIUM                   EMEAN=CMEAN                               EMEAN=      1.70  EDEV=    1.94  CMEAN=     1.70CDEV=     .00
COPPER                     EMEAN=CMEAN                               EMEAN=      4.45  EDEV=    1.94  CMEAN=     4.45CDEV=     .00
NICKLE   T=        .03 NOT SIGNIFICANT EMEAN-CMEAN=      -.35 DEG=  6 EMEAN=     16.75 EDEV=     18.82 CMEAN=     17.10 CDEV=     19.23
LEAD     T=        .11 NOT SIGNIFICANT EMEAN-CMEAN=     -1.45 DEG=  6 EMEAN=     28.70 EDEV=     15.36 CMEAN=     30.15 CDEV=     21.54
ZINC     T=        .02 NOT SIGNIFICANT EMEAN-CMEAN=       .02 DEG=  6 EMEAN=      2.67 EDEV=      1.50 CMEAN=      2.65 CDEV=      1.44
             DAY NUMBER  25
CADMIUM  T=        .72 NOT SIGNIFICANT EMEAN-CMEAN=       .99 DEG=  6 EMEAN=      2.86 EDEV=      1.90 CMEAN=      1.87 CDEV=      1.99
CHROMIUM T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=       .52 DEG=  6 EMEAN=      2.22 EDEV=      1.05 CMEAN=      1.70 CDEV=       .00
COPPER                     EMEAN=CMEAN                               EMEAN=      4.45  EDEV=    1.05  CMEAN=     4.45CDEV=     .00
NICKLE   T=        .39 NOT SIGNIFICANT EMEAN-CMEAN=      5.77 DEG=  5 EMEAN=     22.92 EDEV=     19.46 CMEAN=     17.15 CDEV=     19.28
LEAD     T=        .43 NOT SIGNIFICANT EMEAN-CMEAN=      5.95 DEG=  6 EMEAN=     32.47 EDEV=     19.53 CMEAN=     26.52 CDEV=     19.43
ZINC     T=       1.28 NOT SIGNIFICANT EMEAN-CMEAN=      1.55 DEG=  6 EMEAN=      4.07 EDEV=      2.05 CMEAN=      2.52 CDEV=      1.30
             DAY NUMBER  50
CADMIUM  T=        .33 NOT SIGNIFICANT EMEAN-CMEAN=      -.20 DEG=  4 EMEAN=      4.30 EDEV=       .81 CMEAN=      4.50 CDEV=       .14
CHROMIUM T=        .96 NOT SIGNIFICANT EMEAN-CMEAN=      -.80 DEG=  4 EMEAN=      2.65 EDEV=      1.11 CMEAN=      3.45 CDEV=       .07
COPPER   T=        .00 NOT'SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE   T=       3.24  SIGNIFICANT    EMEAN-CMEAN=     -4.25 DEG=  4 EMEAN=     32.45 EDEV=      1.75 CMEAN=     36.70 CDEV=       .14
LEAD     T=        .97 NOT SIGNIFICANT EMEAN-CMEAN=     13.10 DEG=  4 EMEAN=     26.95 EDEV=     17.93 CMEAN=     13.85 CDEV=      1.63
ZINC     T=       1.01 NOT SIGNIFICANT EMEAN-CMEAN=      8.17 DEG=  4 EMEAN=     14.62 EDEV=     10.77 CMEAN=      6.45 CDEV=      2.05
             DAY NUMBER 125
CADMIUM  T=        .82 NOT SIGNIFICANT EMEAN-CMEAN=      -.75 DEG=  4 EMEAN=      4.35 EDEV=      1.21 CMEAN=      5.10 CDEV=       .28
CHROMIUM T=       2.47 NOT SIGNIFICANT EMEAN-CMEAN=     -2.00 DEG=  4 EMEAN=      2.20 EDEV=      1.00 CMEAN=      4.20 CDEV=       .71
COPPER   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE   T=       3.38  SIGNIFICANT    EMEAN-CMEAN=      2.25 DEG=  4 EMEAN=     33.20 EDEV=       .43 CMEAN=     30.95 CDEV=      1.34
LEAD     T=        .92 NOT SIGNIFICANT EMEAN-CMEAN=      2.15 DEG=  4 EMEAN=     47.10 EDEV=      2.80 CMEAN=     44.95 CDEV=      2.33
ZINC     T=        .56 NOT SIGNIFICANT EMEAN-CMEAN=       .97 DEG=  4 EMEAN=      4.07 EDEV=      2.31 CMEAN=      3.10 CDEV=       .14
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     HOLOTHUR      BODY          EXPERIMENT NO=1
           DAY NUMBER   0                                                                                      3
CADMIUM   T=      8.50  SIGNIFICANT     EMEAN-CMEAN=      -.95 DEG=  2 EMEAN=     1.45 EDEV=      .07 CMEAN=     2.40 CDEV=      .14
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .07  CMEAN=     1.70CDEV=    .00
COPPER                     EMEAN=CMEAN                                EMEAN=     4.45  EDEV=    .07  CMEAN=     4.45CDEV=    .00
NICKLE                     EMEAN=CMEAN                                EMEAN=    11.95  EDEV=    .07  CMEAN=    11.95CDEV=    .07
LEAD      T=      3.94 NOT SIGNIFICANT EMEAN-CMEAN=     -3.55 DEG=  2 EMEAN=     7.00 EDEV=     1.27 CMEAN=    10.55 CDEV=      .07
ZINC      T=      1.57 NOT SIGNIFICANT EMEAN-CMEAN=     -4.65 DEG=  2 EMEAN=    18.05 EDEV=     2.47 CMEAN=    22.70 CDEV=     3.39
           DAY NUMBER   1
CADMIUM   T=       .05 NOT SIGNIFICANT EMEAN-CMEAN=      -.05 DEG=  2 EMEAN=      .82 EDEV=      .95 CMEAN=      .87 CDEV=     1.03
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .95  CMEAN=     1.70CDEV=    .00
COPPER                     EMEAN=CMEAN                                EMEAN=     4.45  EDEV=    .95  CMEAN=     4.45CDEV=    .00
NICKLE    T=       .89 NOT SIGNIFICANT EMEAN-CMEAN=     -1.60 DEG=  2 EMEAN=    10.40 EDEV=     2.12 CMEAN=    12.00 CDEV=     1.41
LEAD      T=       .33 NOT SIGNIFICANT EMEAN-CMEAN=      1.55 DEG=  2 EMEAN=     7.05 EDEV=     6.01 CMEAN=     5.50 CDEV=     2.97
ZINC      T=      1.03 NOT SIGNIFICANT EMEAN-CMEAN=      1.65 DEG=  2 EMEAN=    10.65 EDEV=     1.77 CMEAN=     9.00 CDEV=     1.41
           DAY NUMBER   5
CADMIUM   T=      1.15 NOT SIGNIFICANT EMEAN-CMEAN=       .55 DEG=  4 EMEAN=     1.90 EDEV=      .64 CMEAN=     1.35 CDEV=      .07
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .64  CMEAN=     1.70CDEV=    .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  4 EMEAN=     4.45 EDEV=      .00 CMEAN=     4.45 CDEV=      .00
NICKLE    T=       .13 NOT SIGNIFICANT EMEAN-CMEAN=      -.07 DEG=  3 EMEAN=    10.43 EDEV=      .45 CMEAN=    10.50 CDEV=      .71
LEAD      T=     13.82  SIGNIFICANT     EMEAN-CMEAN=      5.52 DEG=  4 EMEAN=    11.97 EDEV=      .49 CMEAN=     6.45 CDEV=      .35
ZINC      T=      2.99  SIGNIFICANT     EMEAN-CMEAN=      4.52 DEG=  4 EMEAN=    12.62 EDEV=     1.96 CMEAN=     8.10 CDEV=      .85
           DAY NUMBER  25
CADMIUM   T=      3.05 NOT SIGNIFICANT EMEAN-CMEAN=       .55 DEG=  2 EMEAN=     1.45 EDEV=      .21 CMEAN=      .90 CDEV=      .14
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .21  CMEAN=     1.70CDEV=    .00
COPPER                     EMEAN=CMEAN                                EMEAN=     4.45  EDEV=    .21  CMEAN=     4.45CDEV=    .00
NICKLE    T=      5.33  SIGNIFICANT     EMEAN-CMEAN=      5.40 DEG=  2 EMEAN=    11.95 EDEV=     1.34 CMEAN=     6.55 CDEV=      .49
LEAD      T=       .38 NOT SIGNIFICANT EMEAN-CMEAN=      1.80 DEG=  2 EMEAN=     7.60 EDEV=     6.65 CMEAN=     5.80 CDEV=      .42
ZINC      T=      3.14 NOT SIGNIFICANT EMEAN-CMEAN=      3.30 DEG=  2 EMEAN=     9.95 EDEV=      .07 CMEAN=     6.65 CDEV=     1.48
           DAY NUMBER  50
CADMIUM   T=      1.46 NOT SIGNIFICANT EMEAN-CMEAN=     -3.50 DEG=  4 EMEAN=     2.40 EDEV=      .24 CMEAN=     5.90 CDEV=     5.52
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .24  CMEAN=     1.70CDEV=    .00
COPPER    T=      1.63 NOT SIGNIFICANT EMEAN-CMEAN=     -2.68 DEG=  4 EMEAN=     4.45 EDEV=      .00 CMEAN=     7.12 CDEV=     3.78
NICKLE    T=       .62 NOT SIGNIFICANT EMEAN-CMEAN=      -.77 DEG=  3 EMEAN=     9.23 EDEV=     1.33 CMEAN=    10.00 CDEV=     1.41
LEAD      T=      1.06 NOT SIGNIFICANT EMEAN-CMEAN=      4.72 DEG=  4 EMEAN=     7.77 EDEV=     5.96 CMEAN=     3.05 CDEV=      .21
ZINC      T=       .25 NOT SIGNIFICANT EMEAN-CMEAN=      1.82 DEG=  4 EMEAN=    15.37 EDEV=     9.75 CMEAN=    13.55 CDEV=     2.19
           DAY NUMBER 125
CADMIUM   T=      2.65 NOT SIGNIFICANT EMEAN-CMEAN=     -1.20 DEG=  3 EMEAN=      .90 EDEV=      .00 CMEAN=     2.10 CDEV=      .61
CHROMIUM                   EMEAN=CMEAN                                EMEAN=     1.70  EDEV=    .00  CMEAN=     1.70CDEV=    .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=       .00 DEG=  3 EMEAN=     4.45 EDEV=      .00 CMEAN=     4.45 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -7.65 DEG=  0 EMEAN=      .00 EDEV=      .00 CMEAN=     7.65 CDEV=      .21
LEAD      T=       .13 NOT SIGNIFICANT EMEAN-CMEAN=      -.22 DEG=  3 EMEAN=    11.25 EDEV=     1.06 CMEAN=    11.47 CDEV=     2.14
ZINC      T=      1.12 NOT SIGNIFICANT EMEAN-CMEAN=     -2.57 DEG=  3 EMEAN=     7.00 EDEV=      .71 CMEAN=     9.57 CDEV=     3.04
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    HOLOTHUR      INTERNAL      EXPERIMENT NO=1                                                                4
             DAY NUMBER    0
CADMIUM  T=      1.04 NOT SIGNIFICANT EMEAN-CMEAN=     -.55 DEG=  4 EMEAN=     1.15 EDEV=      .21 CMEAN=    1.70 CDEV=      .69
CHROMIUM T=      4.49  SIGNIFICANT    EMEAN-CMEAN=   -11.02 DEG=  5 EMEAN=     7.50 EDEV=      .71 CMEAN=   18.52 CDEV=     3.26
COPPER   T=       .47 NOT SIGNIFICANT EMEAN-CMEAN=    -1.66 DEG=  5 EMEAN=     7.27 EDEV=     4.00 CMEAN=    8.94 CDEV=     4.35
NICKLE   T=      1.75 NOT SIGNIFICANT EMEAN-CMEAN=    -5.74 DEG=  5 EMEAN=  * 18.50 EDEV=     1.98 CMEAN=   24.24 CDEV=     4.26
LEAD     T=      2.96  SIGNIFICANT    EMEAN-CMEAN=    -6.41 DEG=  5 EMEAN=     4.15 EDEV=     2.47 CMEAN=   10.56 CDEV=     2.62
ZINC     T=      2.82  SIGNIFICANT    EMEAN-CMEAN=   -10.40 DEG=  5 EMEAN=    32.10 EDEV=     8.20 CMEAN=   42.50 CDEV=     2.72
             DAY NUMBER    1
CADMIUM  T=      1.69 NOT SIGNIFICANT EMEAN-CMEAN=     1.17 DEG=  3 EMEAN=     2.10 EDEV=      .52 CMEAN=     .92 CDEV=     1.10
CHROMIUM T=       .05 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  3 EMEAN=     9.80 EDEV=     2.50 CMEAN=    9.90 CDEV=     1.27
COPPER   T=       .91 NOT SIGNIFICANT EMEAN-CMEAN=     2.26 DEG=  3 EMEAN=    10.03 EDEV=      .12 CMEAN=    7.77 CDEV=     4.70
NICKLE   T=      3.33  SIGNIFICANT    EMEAN-CMEAN=    -6.82 DEG=  3 EMEAN=    14.53 EDEV=     1.42 CMEAN=   21.35 CDEV=     3.32
LEAD     T=     22.17  SIGNIFICANT    EMEAN-CMEAN=    13.35 DEG=  2 EMEAN=    16.75 EDEV=      .07 CMEAN=    3.40 CDEV=      .05
ZINC     T=      4.17  SIGNIFICANT    EMEAN-CMEAN=    26.05 DEG=  3 EMEAN=    60.70 EDEV=     7.80 CMEAN=   34.65 CDEV=     4.03
             DAY NUMBER    5
CADMIUM  T=       .22 NOT SIGNIFICANT EMEAN-CMEAN=      .25 DEG=  2 EMEAN=     1.07 EDEV=     1.31 CMEAN=     .82 CDEV=      .95
CHROMIUM T=      5.91  SIGNIFICANT    EMEAN-CMEAN=     7.75 DEG=  2 EMEAN=    13.90 EDEV=     1.41 CMEAN=    6.15 CDEV=     1.20
COPPER   T= 86425.60  SIGNIFICANT    EMEAN-CMEAN=    10.55 DEG=  2 EMEAN=    15.00 EDEV=      .00 CMEAN=    4.45 CDEV=      .00
NICKLE   T=     15.39  SIGNIFICANT    EMEAN-CMEAN=     8.50 DEG=  2 EMEAN=    24.85 EDEV=      .07 CMEAN=   16.35 CDEV=      .78
LEAD     T=      4.35  SIGNIFICANT    EMEAN-CMEAN=    18.50 DEG=  2 EMEAN=    21.55 EDEV=     6.01 CMEAN=    3.05 CDEV=      .35
ZINC     T=     27.66  SIGNIFICANT    EMEAN-CMEAN=    28.00 DEG=  2 EMEAN=    56.15 EDEV=      .78 CMEAN=   28.15 CDEV=     1.20
             DAY NUMBER   25
CADMIUM  T=      1.72 NOT SIGNIFICANT EMEAN-CMEAN=     1.45 DEG=  5 EMEAN=     3.57 EDEV=      .25 CMEAN=    2.11 CDEV=     1.41
CHROMIUM T=     15.47  SIGNIFICANT    EMEAN-CMEAN=    14.38 DEG=  4 EMEAN=    26.00 EDEV=     1.41 CMEAN=   11.62 CDEV=      .93
COPPER   T=     16.31  SIGNIFICANT    EMEAN-CMEAN=    19.90 DEG=  3 EMEAN=    29.80 EDEV=     2.26 CMEAN=    9.90 CDEV=      .35
NICKLE   T=       .12 NOT SIGNIFICANT EMEAN-CMEAN=      .43 DEG=  4 EMEAN=    21.90 EDEV=      .71 CMEAN=   21.47 CDEV=     4.68
LEAD     T=     18.8        SIGNIFICANT EMEAN-CMEAN=   49.83 DEG=  3 EMEAN=    63.20 EDEV=     4.24 CMEAN=   13.37 CDEV=     1.45
ZINC     T=     11.24 .SIGNIFICANT    EMEAN-CMEAN=    29.43 DEG=  3 EMEAN=    65.30 EDEV=     4.67 CMEAN=   35.87 CDEV=     1.21
             DAY NUMBER   50
CADMIUM  T=      1.96 NOT SIGNIFICANT EMEAN-CMEAN=     1.08 DEG=  4 EMEAN=     3.20 EDEV=      .71 CMEAN=    2.12 CDEV=      .61
CHROMIUM T=     13.2        SIGNIFICANT EMEAN-CMEAN=   20.2   DEG=  3 EMEAN=    29.90 EDEV=     2.83 CMEAN=    9.7  CDEV=     1.47
COPPER   T=      7.3        SIGNIFICANT EMEAN-CMEAN=   27.4 . DEG=  2 EMEAN=    37.35 EDEV=     4.88 CMEAN=    9.95 CDEV=     0.64
NICKLE   T=      1.26 NOT SIGNIFICANT EMEAN-CMEAN=     1.28 DEG=  3 EMEAN=    22.45 EDEV=     2.05 CMEAN=   21.17 CDEV=     1.10
LEAD     T=     22.33  SIGNIFICANT    EMEAN-CMEAN=    65.72 DEG=  4 EMEAN=    79.30 EDEV=     4.95 CMEAN=   13.87 CDEV=     2.69
ZINC     T=      9.03  SIGNIFICANT    EMEAN-CMEAN=    50.10 DEG=  4 EMEAN=    79.75 EDEV=      .07 CMEAN=   29.65 CDEV=     7.40
             DAY NUMBER  125
CADMIUM  T=       .71 NOT SIGNIFICANT EMEAN-CMEAN=     -.40 DEG=  4 EMEAN=     2.35 EDEV=      .07 CMEAN=    2.75 CDEV=      .75
CHROMIUM T=     67.37  SIGNIFICANT    EMEAN-CMEAN=    11.85 DEG=  4 EMEAN=    29.65 EDEV=      .07 CMEAN=   17.80 CDEV=      .23
COPPER   T=      4.48  SIGNIFICANT    EMEAN-CMEAN=    11.95 DEG=  4 EMEAN=    26.80 EDEV=     1.56 CMEAN=   14.85 CDEV=     3.44
NICKLE   T=     11.30  SIGNIFICANT    EMEAN-CMEAN=    -4.55 DEG=  4 EMEAN=    23.85 EDEV=      .21 CMEAN=   28.40 CDEV=      .52
LEAD     T=     14.89       SIGNIFICANT EMEAN-CMEAN=   45.6   DEG=  3 EMEAN=    68.15 EDEV=     4.03 CMEAN=   22.6  CDEV=     2.56
ZINC     T=      9.62  SIGNIFICANT    EMEAN-CMEAN=    18.47 DEG=  4 EMEAN=    62.60 EDEV=     2.55 CMEAN=   44.12 CDEV=     2.10
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      HOLOTHUR      MUSCLE        EXPERIMENT NO=1                                                                            5
           DAY NUMBER   1
 CADMIUM  T=       .48 NOT SIGNIFICANT EMEAN-CMEAN=       -.25 DEG=  7 EMEAN=      1.19 EDEV=       .68 CMEAN=      1.44 CDEV=      .88
 CHROMIUM T=      1.97 NOT SIGNIFICANT EMEAN-CMEAN=       -.98 DEG=  7 EMEAN=      1.70 EDEV=       .00 CMEAN=      2.67 CDEV=     1.13
 COPPER   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=       -.00 DEG=  7 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=      .00
 NICKLE   T=      2.46  SIGNIFICANT    EMEAN-CMEAN=      -2.20 DEG=  6 EMEAN=      8.10 EDEV=       .84 CMEAN=     10.30 CDEV=     1.58
 LEAD     T=       .15 NOT SIGNIFICANT EMEAN-CMEAN=        .44 DEG=  7 EMEAN=      8.74 EDEV=      4.08 CMEAN=      8.30 CDEV=     4.59
 ZINC     T=      1.41 NOT SIGNIFICANT EMEAN-CMEAN=      15.77 DEG=  6 EMEAN=     71.20 EDEV=     19.62 CMEAN=     55.42 CDEV=    10.66
           DAY NUMBER   5
 CADMIUM  T=       .87 NOT SIGNIFICANT EMEAN-CMEAN=       1.01 DEG=  3 EMEAN=      1.78 EDEV=      1.43 CMEAN=       .77 CDEV=      .88
 CHROMIUM T=      1.15 NOT SIGNIFICANT EMEAN-CMEAN=        .90 DEG=  4 EMEAN=      2.60 EDEV=      1.04 CMEAN=      1.70 CDEV=      .00
 COPPER   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=       -.00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=      .00
 NICKLE   T=      1.41 NOT SIGNIFICANT EMEAN-CMEAN=       1.82 DEG=  4 EMEAN=     10.37 EDEV=      1.67 CMEAN=      8.55 CDEV=      .78
 LEAD     T=       .47 NOT SIGNIFICANT EMEAN-CMEAN=      -2.15 DEG=  4 EMEAN=      7.55 EDEV=      6.09 CMEAN=      9.70 CDEV=      .28
 ZINC     T=      2.09 NOT SIGNIFICANT EMEAN-CMEAN=      16.97 DEG=  4 EMEAN=     62.52 EDEV=     10.72 CMEAN=     45.55 CDEV=     2.76
           DAY NUMBER  25
 CADMIUM  T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=       -.77 DEG=  2 EMEAN=       .15 EDEV=       .00 CMEAN=       .92 CDEV=     1.10
 CHROMIUM                  EMEAN=CMEAN                               EMEAN=      1.70  EDEV=     .00   CMEAN=     1.70CDEV=    .00
 COPPER                    EMEAN=CMEAN                               EMEAN=      4.45  EDEV=     .00   CMEAN=     4.45CDEV=    .00
 NICKLE                    EMEAN=CMEAN                               EMEAN=      3.85  EDEV=     .00   CMEAN=     3.85CDEV=    .07
 LEAD     T=       .48 NOT SIGNIFICANT EMEAN-CMEAN=       -.65 DEG=  2 EMEAN=     12.90 EDEV=      1.84 CMEAN=     13.55 CDEV=      .49
 ZINC     T=      1.48 NOT SIGNIFICANT EMEAN-CMEAN=       3.35 DEG=  2 EMEAN=     67.70 EDEV=       .28 CMEAN=     64.35 CDEV=     3.18
           DAY NUMBER  50
 CADMIUM  NO EXPERMENT MEAN=     1.65 DEVIATION=       .75 NUM= 4
 CHROMIUM NO EXPERMENT MEAN=     6.35 DEVIATION=      4.24 NUM= 4
 COPPER   NO EXPERMENT MEAN=     4.45 DEVIATION=       .00 NUM= 4
 NICKLE   NO EXPERMENT MEAN=    12.22 DEVIATION=      3.37 NUM= 4
 LEAD     NO EXPERMENT MEAN=    11.15 DEVIATION=      2.76 NUM= 4
 ZINC     NO EXPERMENT MEAN=    41.87 DEVIATION=      9.92 NUM= 4
           DAY NUMBER 125
 CADMIUM  T=      1.24 NOT SIGNIFICANT EMEAN-CMEAN=      -1.18 DEG=  4 EMEAN=      1.30 EDEV=       .14 CMEAN=      2.47 CDEV=     1.27
 CHROMIUM T=       .81 NOT SIGNIFICANT EMEAN-CMEAN=      -1.47 DEG=  4 EMEAN=      3.70 EDEV=       .42 CMEAN=      5.17 CDEV=     2.41
 COPPER   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=        .00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=      .00
 NICKLE   T=      1.85 NOT SIGNIFICANT EMEAN-CMEAN=      -6.40 DEG=  4 EMEAN=      9.95 EDEV=       .07 CMEAN=     16.35 CDEV=     4.61
 LEAD     T=      2.11 NOT SIGNIFICANT EMEAN-CMEAN=      -8.77 DEG=  4 EMEAN=      2.90 EDEV=       .00 CMEAN=     11.67 CDEV=     5.55
 ZINC     T=       .48 NOT SIGNIFICANT EMEAN-CMEAN=       3.80 DEG=  4 EMEAN=     49.75 EDEV=      2.76 CMEAN=     45.95 CDEV=    10.38
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     MANGROVE     BODY          EXPERIMENT NO=1                                                      6
           DAY NUMBER    0
CADMIUM  T=       .77 NOT SIGNIFICANT EMEAN-CMEAN=      .07 DEG=  3 EMEAN=      .50 EDEV=      .00 CMEAN=      .43 CDEV=      .12
CHROMIUM T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=      .73 DEG=  4 EMEAN=     2.43 EDEV=     1.27 CMEAN=     1.70 CDEV=      .00
COPPER                  EMEAN=CMEAN                               EMEAN=     4.45  EDEV=   1.27  CMEAN=     4.45CDEV=    .00
NICKLE   T=      2.94  SIGNIFICANT    EMEAN-CMEAN=      .37 DEG=  4 EMEAN=     1.73 EDEV=      .15 CMEAN=     1.37 CDEV=      .15
LEAD                    EMEAN=CMEAN                               EMEAN=      .25  EDEV=    .15  CMEAN=      .25CDEV=    .00
ZINC     T=       .07 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     4.70 EDEV=      .35 CMEAN=     4.73 CDEV=      .75
           DAY NUMBER    5
CADMIUM  T=      1.20 NOT SIGNIFICANT EMEAN-CMEAN=      .60 DEG=  2 EMEAN=     1.00 EDEV=      .71 CMEAN=      .40 CDEV=      .00
CHROMIUM                EMEAN=CMEAN                               EMEAN=     1.70  EDEV=    .71  CMEAN=     1.70CDEV=    .00
COPPER                  EMEAN=CMEAN                               EMEAN=     4.45  EDEV=    .71  CMEAN=     4.45CDEV=    .00
NICKLE   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -3.00 DEG=  0 EMEAN=     3.00 EDEV=      .00 CMEAN=     6.00 CDEV=     4.24
LEAD                    EMEAN=CMEAN                               EMEAN=      .25  EDEV=    .00  CMEAN=      .25CDEV=    .00
ZINC                    EMEAN=CMEAN                               EMEAN=     1.40  EDEV=    .00  CMEAN=     1.40CDEV=    .00
           DAY NUMBER   50
CADMIUM  T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -.05 DEG=  2 EMEAN=      .65 EDEV=      .07 CMEAN=      .70 CDEV=      .00
CHROMIUM                EMEAN=CMEAN                               EMEAN=     1.70  EDEV=    .07  CMEAN=     1.70CDEV=    .00
COPPER                  EMEAN=CMEAN                               EMEAN=     4.45  EDEV=    .07  CMEAN=     4.45CDEV=    .00
NICKLE   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -3.00 DEG=  0 EMEAN=      .00 EDEV=      .00 CMEAN=     3.00 CDEV=      .00
LEAD     T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     1.37 DEG=  2 EMEAN=     1.62 EDEV=     1.94 CMEAN=      .25 CDEV=      .00
ZINC                    EMEAN=CMEAN                               EMEAN=     1.40  EDEV=   1.94  CMEAN=     1.40CDEV=    .00
           DAY NUMBER  125
CADMIUM    NO EXPERMENT MEAN=      .85 DEVIATION=      .21 NUM= 2
CHROMIUM   NO EXPERMENT MEAN=     1.70 DEVIATION=      .00 NUM= 2
COPPER     NO EXPERMENT MEAN=     4.45 DEVIATION=      .00 NUM= 2
NICKLE     NO EXPERMENT MEAN=      .00 DEVIATION=      .00 NUM= 0
LEAD       NO EXPERMENT MEAN=     3.50 DEVIATION=      .71 NUM= 2
ZINC       NO EXPERMENT MEAN=     2.35 DEVIATION=     1.34 NUM= 2
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      MANGROVE      STEM           EXPERIMENT NO=1
            DAY NUMBER    0                                                                                          7
CADMIUM   T=       .77 NOT SIGNIFICANT EMEAN-CMEAN=       -.03 DEG=  3 EMEAN=       .30 EDEV=       .00 CMEAN=       .33 CDEV=       .06
CHROMIUM  T=     28.17  SIGNIFICANT    EMEAN-CMEAN=       2.10 DEG=  3 EMEAN=      3.80 EDEV=       .14 CMEAN=      1.70 CDEV=       .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=        .00 DEG=  3 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE    T=       .81 NOT SIGNIFICANT EMEAN-CMEAN=       -.20 DEG=  3 EMEAN=      2.00 EDEV=       .28 CMEAN=      2.20 CDEV=       .26
LEAD                      EMEAN=CMEAN                                EMEAN=       .25  EDEV=     .28  CMEAN=       .25CDEV=     .00
ZINC      T=       .89 NOT SIGNIFICANT EMEAN-CMEAN=        .32 DEG=  3 EMEAN=      5.95 EDEV=       .35 CMEAN=      5.63 CDEV=       .40
            DAY NUMBER    5
CADMIUM   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=        .20 DEG=  0 EMEAN=      1.20 EDEV=       .00 CMEAN=      1.00 CDEV=       .00
CHROMIUM  T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      -3.10 DEG=  0 EMEAN=      1.70 EDEV=       .00 CMEAN=      4.80 CDEV=       .00
COPPER                    EMEAN=CMEAN                                EMEAN=      4.45  EDEV=     .00  CMEAN=      4.45CDEV=     .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      -7.20 DEG=  0 EMEAN=      2.40 EDEV=       .00 CMEAN=      9.60 CDEV=       .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -15.75 DEG=  0 EMEAN=       .25 EDEV=       .00 CMEAN=     16.00 CDEV=       .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -27.80 DEG=  0 EMEAN=      3.80 EDEV=       .00 CMEAN=     31.60 CDEV=       .00
            DAY NUMBER   50
CADMIUM   T= 45404.67   SIGNIFICANT    EMEAN-CMEAN=       -.60 DEG=  2 EMEAN=       .80 EDEV=       .00 CMEAN=      1.40 CDEV=       .00
CHROMIUM                  EMEAN=CMEAN                                EMEAN=      1.70  EDEV=     .00  CMEAN=      1.70CDEV=     .00
COPPER                    EMEAN=CMEAN                                EMEAN=      4.45  EDEV=     .00  CMEAN=      4.45CDEV=     .00
NICKLE    T=      4.92  SIGNIFICANT    EMEAN-CMEAN=        .55 DEG=  2 EMEAN=      2.25 EDEV=       .07 CMEAN=      1.70 CDEV=       .14
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=       3.75 DEG=  2 EMEAN=      4.00 EDEV=       .00 CMEAN=       .25 CDEV=       .00
ZINC      T=      2.91 NOT SIGNIFICANT EMEAN-CMEAN=      -2.80 DEG=  2 EMEAN=      2.95 EDEV=       .21 CMEAN=      5.75 CDEV=      1.34
            DAY NUMBER  125
CADMIUM   T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=       -.05 DEG=  2 EMEAN=      1.00 EDEV=       .00 CMEAN=      1.05 CDEV=       .07
CHROMIUM                  EMEAN=CMEAN                                EMEAN=      1.70  EDEV=     .00  CMEAN=      1.70CDEV=     .00
COPPER                    EMEAN=CMEAN                                EMEAN=      4.45  EDEV=     .00  CMEAN=      4.45CDEV=     .00
NICKLE    T=      3.46 NOT SIGNIFICANT EMEAN-CMEAN=       1.35 DEG=  2 EMEAN=      3.70 EDEV=       .42 CMEAN=      2.35 CDEV=       .35
LEAD      T=       .45 NOT SIGNIFICANT EMEAN-CMEAN=        .50 DEG=  2 EMEAN=      4.00 EDEV=      1.41 CMEAN=      3.50 CDEV=       .71
ZINC      T=      1.92 NOT SIGNIFICANT EMEAN-CMEAN=       1.45 DEG=  2 EMEAN=      5.65 EDEV=      1.06 CMEAN=      4.20 CDEV=       .14
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    MANGROVE      LEAF           EXPERIMENT NO=1
           DAY NUMBER   5
CADMIUM  T=      4.62 NOT SIGNIFICANT EMEAN-CMEAN=      -.80 DEG=  1 EMEAN=       .70 EDEV=       .14 CMEAN=     1.50 CDEV=       .00
CHROMIUM                   EMEAN=CMEAN                                 EMEAN=      1.70  EDEV=     .14  CMEAN=     1.70CDEV=     .00
~~COPPER~~   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -4.55 DEG=  1 EMEAN=      4.45 EDEV=       .00 CMEAN=     9.00 CDEV=       .00
NICKLE   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -4.50 DEG= -1 EMEAN=       .00 EDEV=       .00 CMEAN=     4.50 CDEV=       .00
LEAD                       EMEAN=CMEAN                                 EMEAN=       .25  EDEV=     .00  CMEAN=      .25CDEV=     .00
ZINC     T=     12.89  SIGNIFICANT    EMEAN-CMEAN=     -3.35 DEG=  1 EMEAN=      8.15 EDEV=       .21 CMEAN=    11.50 CDEV=       .00
           DAY NUMBER  50
CADMIUM  T=      1.41 NOT SIGNIFICANT EMEAN-CMEAN=      -.10 DEG=  2 EMEAN=      1.05 EDEV=       .07 CMEAN=     1.15 CDEV=       .07
CHROMIUM                   EMEAN=CMEAN                                 EMEAN=      1.70  EDEV=     .07  CMEAN=     1.70CDEV=     .00
COPPER                     EMEAN=CMEAN                                 EMEAN=      4.45  EDEV=     .07  CMEAN=     4.45CDEV=     .00
NICKLE   T=      8.06  SIGNIFICANT    EMEAN-CMEAN=     -4.05 DEG=  2 EMEAN=      3.45 EDEV=       .07 CMEAN=     7.50 CDEV=       .71
LEAD     T=      2.83 NOT SIGNIFICANT EMEAN-CMEAN=     -2.00 DEG=  2 EMEAN=      4.50 EDEV=       .71 CMEAN=     6.50 CDEV=       .71
ZINC     T=     10.11  SIGNIFICANT    EMEAN-CMEAN=     -3.95 DEG=  2 EMEAN=      7.80 EDEV=       .42 CMEAN=    11.75 CDEV=       .35
           DAY NUMBER 125
CADMIUM  T=      2.83 NOT SIGNIFICANT EMEAN-CMEAN=      -.20 DEG=  2 EMEAN=       .95 EDEV=       .07 CMEAN=     1.15 CDEV=       .07
CHROMIUM                   EMEAN=CMEAN                                 EMEAN=      1.70  EDEV=     .07  CMEAN=     1.70CDEV=     .00
COPPER                     EMEAN=CMEAN                                 EMEAN=      4.45  EDEV=     .07  CMEAN=     4.45CDEV=     .00
NICKLE                     EMEAN=CMEAN                                 EMEAN=       .00  EDEV=     .07  CMEAN=      .00CDEV=     .00
LEAD     T=      3.00 NOT SIGNIFICANT EMEAN-CMEAN=      1.50 DEG=  2 EMEAN=      5.50 EDEV=       .71 CMEAN=     4.00 CDEV=       .00
ZINC     T=      9.47  SIGNIFICANT    EMEAN-CMEAN=      2.55 DEG=  2 EMEAN=     10.25 EDEV=       .35 CMEAN=     7.70 CDEV=       .14
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     MANGROVE      ROOT          EXPERIMENT NO=1                                                              9
          DAY NUMBER    5
CADMIUM   T=       3.00 NOT SIGNIFICANT EMEAN-CMEAN=       .15 DEG=  2 EMEAN=      1.20 EDEV=       .00 CMEAN=      1.05 CDEV=       .07
CHROMIUM                     EMEAN=CMEAN                               EMEAN=      1.70  EDEV=     .00  CMEAN=     1.70CDEV=     .00
COPPER                       EMEAN=CMEAN                               EMEAN=      4.45  EDEV=     .00  CMEAN=     4.45CDEV=     .00
NICKLE    T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=     -6.00 DEG=  0 EMEAN=       .00 EDEV=       .00 CMEAN=      6.00 CDEV=       .00
LEAD      T=       3.00 NOT SIGNIFICANT EMEAN-CMEAN=     -1.50 DEG=  2 EMEAN=      4.00 EDEV=       .00 CMEAN=      5.50 CDEV=       .71
ZINC      T=       3.77 NOT SIGNIFICANT EMEAN-CMEAN=      3.70 DEG=  2 EMEAN=     11.55 EDEV=      1.34 CMEAN=      7.85 CDEV=       .35
          DAY NUMBER   50
CADMIUM   T=       3.00 NOT SIGNIFICANT EMEAN-CMEAN=       .30 DEG=  2 EMEAN=      1.80 EDEV=       .00 CMEAN=      1.50 CDEV=       .14
CHROMIUM                     EMEAN=CMEAN                               EMEAN=      1.70  EDEV=     .00  CMEAN=     1.70CDEV=     .00
COPPER                       EMEAN=CMEAN                               EMEAN=      4.45  EDEV=     .00  CMEAN=     4.45CDEV=     .00
NICKLE    T=       ****     SIGNIFICANT EMEAN-CMEAN=            DEG=  1 EMEAN=      9.00 EDEV=       .00 CMEAN=      5.50 CDEV=      0.0
LEAD      T=       2.83 NOT SIGNIFICANT EMEAN-CMEAN=      2.00 DEG=  2 EMEAN=      7.50 EDEV=       .71 CMEAN=      5.50 CDEV=       .71
ZINC      T=      12.63     SIGNIFICANT EMEAN-CMEAN=     12.65 DEG=  2 EMEAN=     23.95 EDEV=       .07 CMEAN=     11.30 CDEV=      1.41
          DAY NUMBER  125
CADMIUM   T=        .28 NOT SIGNIFICANT EMEAN-CMEAN=      -.12 DEG=  3 EMEAN=      1.05 EDEV=       .78 CMEAN=      1.17 CDEV=       .06
CHROMIUM  T=       3.02 NOT SIGNIFICANT EMEAN-CMEAN=      3.77 DEG=  3 EMEAN=      7.00 EDEV=      1.41 CMEAN=      3.23 CDEV=      1.34
COPPER    T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=       .00 DEG=  3 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE    T=       5.28     SIGNIFICANT EMEAN-CMEAN=      5.75 DEG=  3 EMEAN=     16.45 EDEV=      2.05 CMEAN=     10.70 CDEV=       .17
LEAD      T=       3.06 NOT SIGNIFICANT EMEAN-CMEAN=      3.00 DEG=  3 EMEAN=     10.50 EDEV=       .71 CMEAN=      7.50 CDEV=      1.22
ZINC      T=       4.33     SIGNIFICANT EMEAN-CMEAN=     19.05 DEG=  3 EMEAN=     49.35 EDEV=      6.29 CMEAN=     30.30 CDEV=      3.87
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     NERITA        INTERNAL      EXPERIMENT NO=1                                                                  10
              DAY NUMBER    0
   CADMIUM  T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       1.90 DEG=  0 EMEAN=      5.40 EDEV=        .00 CMEAN=      3.50 CDEV=        .00
   CHROMIUM T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       7.30 DEG=  0 EMEAN=     10.80 EDEV=        .00 CMEAN=      3.50 CDEV=        .00
   COPPER   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      -8.30 DEG=  0 EMEAN=     46.90 EDEV=        .00 CMEAN=     55.20 CDEV=        .00
   NICKLE   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       -.40 DEG=  0 EMEAN=     27.00 EDEV=        .00 CMEAN=     27.40 CDEV=        .00
   LEAD     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      20.10 DEG=  0 EMEAN=     40.90 EDEV=        .00 CMEAN=     20.80 CDEV=        .00
   ZINC     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      -9.60 DEG=  0 EMEAN=    119.70 EDEV=        .00 CMEAN=    129.30 CDEV=        .00
              DAY NUMBER    1
   CADMIUM    NO EXPERMENT MEAN=       .15 DEVIATION=       .00 NUM= 1
   CHROMIUM   NO EXPERMENT MEAN=      1.70 DEVIATION=       .00 NUM= 1
   COPPER     NO EXPERMENT MEAN=     62.20 DEVIATION=       .00 NUM= 1
   NICKLE     NO EXPERMENT MEAN=       .45 DEVIATION=       .00 NUM= 1
   LEAD       NO EXPERMENT MEAN=     23.30 DEVIATION=       .00 NUM= 1
   ZINC       NO EXPERMENT MEAN=    175.60 DEVIATION=       .00 NUM= 1
              DAY NUMBER    5
   CADMIUM  T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       2.95 DEG=  0 EMEAN=      3.10 EDEV=        .00 CMEAN=       .15 CDEV=        .00
   CHROMIUM                   EMEAN=CMEAN                                  EMEAN=      1.70  EDEV=     .00  CMEAN=      1.70CDEV=     .00
   COPPER   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       8.10 DEG=  0 EMEAN=     58.40 EDEV=        .00 CMEAN=     50.30 CDEV=        .00
   NICKLE   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      23.55 DEG=  0 EMEAN=     24.00 EDEV=        .00 CMEAN=       .45 CDEV=        .00
   LEAD     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=     -10.60 DEG=  0 EMEAN=     18.10 EDEV=        .00 CMEAN=     28.70 CDEV=        .00
   ZINC     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=     -11.60 DEG=  0 EMEAN=    157.00 EDEV=        .00 CMEAN=    168.60 CDEV=        .00
              DAY NUMBER   25
   CADMIUM                    EMEAN=CMEAN                                  EMEAN=       .15  EDEV=     .00  CMEAN=       .15CDEV=     .00
   CHROMIUM T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      -5.70 DEG=  0 EMEAN=      1.70 EDEV=        .00 CMEAN=      7.40 CDEV=        .00
   COPPER   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       6.40 DEG=  0 EMEAN=     56.00 EDEV=        .00 CMEAN=     49.60 CDEV=        .00
   NICKLE                     EMEAN=CMEAN                                  EMEAN=       .45  EDEV=     .00  CMEAN=       .45CDEV=     .00
   LEAD     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       -.20 DEG=  0 EMEAN=     34.20 EDEV=        .00 CMEAN=     34.40 CDEV=        .00
   ZINC     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=     -70.60 DEG=  0 EMEAN=    118.50 EDEV=        .00 CMEAN=    189.10 CDEV=        .00
              DAY NUMBER   50
   CADMIUM  T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=        .90 DEG=  0 EMEAN=      4.10 EDEV=        .00 CMEAN=      3.20 CDEV=        .00
   CHROMIUM T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       3.90 DEG=  0 EMEAN=      5.60 EDEV=        .00 CMEAN=      1.70 CDEV=        .00
   COPPER   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       3.10 DEG=  0 EMEAN=     53.80 EDEV=        .00 CMEAN=     50.70 CDEV=        .00
   NICKLE   T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=       -.90 DEG=  0 EMEAN=     16.40 EDEV=        .00 CMEAN=     17.30 CDEV=        .00
   LEAD     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=     -10.50 DEG=  0 EMEAN=      6.20 EDEV=        .00 CMEAN=     16.70 CDEV=        .00
   ZINC     T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=      26.70 DEG=  0 EMEAN=    168.50 EDEV=        .00 CMEAN=    141.80 CDEV=        .00
              DAY NUMBER  125
   CADMIUM    NO EXPERMENT MEAN=      3.00 DEVIATION=       .00 NUM= 1
   CHROMIUM   NO EXPERMENT MEAN=     41.60 DEVIATION=       .00 NUM= 1
   COPPER     NO EXPERMENT MEAN=     21.40 DEVIATION=       .00 NUM= 1
   NICKLE     NO EXPERMENT MEAN=      9.90 DEVIATION=       .00 NUM= 1
   LEAD       NO EXPERMENT MEAN=      3.80 DEVIATION=       .00 NUM= 1
   ZINC       NO EXPERMENT MEAN=     82.30 DEVIATION=       .00 NUM= 1
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     NERITA        SHELL          EXPERIMENT NO=1                                                                          11
               DAY NUMBER   0
CADMIUM  T=      1.15 NOT SIGNIFICANT EMEAN-CMEAN=      2.72 DEG=  4 EMEAN=      2.87 EDEV=      3.15 CMEAN=       .15 CDEV=       .00
CHROMIUM T=      1.15 NOT SIGNIFICANT EMEAN-CMEAN=      2.47 DEG=  4 EMEAN=      4.17 EDEV=      2.86 CMEAN=      1.70 CDEV=       .00
COPPER   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      -.00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE   T=      1.15 NOT SIGNIFICANT EMEAN-CMEAN=     17.17 DEG=  4 EMEAN=     17.62 EDEV=     19.85 CMEAN=       .45 CDEV=       .00
LEAD     T=       .91 NOT SIGNIFICANT EMEAN-CMEAN=    -12.38 DEG=  4 EMEAN=     63.47 EDEV=     18.17 CMEAN=     75.85 CDEV=      1.06
ZINC     T=       .72 NOT SIGNIFICANT EMEAN-CMEAN=      -.90 DEG=  4 EMEAN=      6.55 EDEV=      1.66 CMEAN=      7.45 CDEV=       .07
               DAY NUMBER   1
CADMIUM                     EMEAN=CMEAN                           EMEAN=       .15  EDEV=   1.66   CMEAN=       .15CDEV=     .00
CHROMIUM                    EMEAN=CMEAN                           EMEAN=      1.70  EDEV=   1.66   CMEAN=      1.70CDEV=     .00
COPPER                      EMEAN=CMEAN                           EMEAN=      4.45  EDEV=   1.66   CMEAN=      4.45CDEV=     .00
NICKLE                      EMEAN=CMEAN                           EMEAN=       .45  EDEV=   1.66   CMEAN=       .45CDEV=     .00
LEAD     T=      5.21  SIGNIFICANT    EMEAN-CMEAN=     14.35 DEG=  2 EMEAN=     73.65 EDEV=      1.63 CMEAN=     59.30 CDEV=      3.54
ZINC     T=      4.67  SIGNIFICANT    EMEAN-CMEAN=     -2.85 DEG=  2 EMEAN=      9.10 EDEV=       .71 CMEAN=     11.95 CDEV=       .49
               DAY NUMBER   5
CADMIUM  T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -1.67 DEG=  2 EMEAN=       .15 EDEV=       .00 CMEAN=      1.82 CDEV=      2.37
CHROMIUM T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=      1.50 DEG=  2 EMEAN=      3.20 EDEV=      2.12 CMEAN=      1.70 CDEV=       .00
COPPER                      EMEAN=CMEAN                           EMEAN=      4.45  EDEV=   2.12   CMEAN=      4.45CDEV=     .00
NICKLE                      EMEAN=CMEAN                           EMEAN=       .45  EDEV=   2.12   CMEAN=       .45CDEV=     .00
LEAD     T=       .41 NOT SIGNIFICANT EMEAN-CMEAN=     -6.10 DEG=  2 EMEAN=     66.75 EDEV=     21.14 CMEAN=     72.85 CDEV=       .35
ZINC     T=      1.02 NOT SIGNIFICANT EMEAN-CMEAN=     -1.05 DEG=  2 EMEAN=      7.95 EDEV=      1.84 CMEAN=      9.00 CDEV=       .57
               DAY NUMBER  25
CADMIUM                     EMEAN=CMEAN                           EMEAN=       .15  EDEV=   1.34   CMEAN=       .15CDEV=     .00
CHROMIUM                    EMEAN=CMEAN                           EMEAN=      1.70  EDEV=   1.34   CMEAN=      1.70CDEV=     .00
COPPER                      EMEAN=CMEAN                           EMEAN=      4.45  EDEV=   1.34   CMEAN=      4.45CDEV=     .00
NICKLE                      EMEAN=CMEAN                           EMEAN=       .45  EDEV=   1.34   CMEAN=       .45CDEV=     .00
LEAD     T=      1.33 NOT SIGNIFICANT EMEAN-CMEAN=      3.25 DEG=  2 EMEAN=     72.70 EDEV=       .14 CMEAN=     69.45 CDEV=      3.46
ZINC     T=      1.34 NOT SIGNIFICANT EMEAN-CMEAN=     -1.90 DEG=  2 EMEAN=     10.60 EDEV=      1.27 CMEAN=     12.50 CDEV=      1.56
               DAY NUMBER  50
CADMIUM  T=       .42 NOT SIGNIFICANT EMEAN-CMEAN=      -.23 DEG=  4 EMEAN=      4.25 EDEV=       .07 CMEAN=      4.47 CDEV=       .71
CHROMIUM T=       .26 NOT SIGNIFICANT EMEAN-CMEAN=      -.55 DEG=  4 EMEAN=      3.60 EDEV=       .28 CMEAN=      4.15 CDEV=      2.04
COPPER   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=       .00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=       .00
NICKLE   T=       .45 NOT SIGNIFICANT EMEAN-CMEAN=       .20 DEG=  4 EMEAN=     33.15 EDEV=       .64 CMEAN=     32.95 CDEV=       .47
LEAD     T=       .23 NOT SIGNIFICANT EMEAN-CMEAN=      -.77 DEG=  4 EMEAN=     43.20 EDEV=       .85 CMEAN=     43.97 CDEV=      4.52
ZINC     T=       .52 NOT SIGNIFICANT EMEAN-CMEAN=      -.37 DEG=  4 EMEAN=      7.10 EDEV=       .00 CMEAN=      7.47 CDEV=       .97
               DAY NUMBER 125
CADMIUM    NO EXPERMENT MEAN=      4.35 DEVIATION=       .07 NUM= 2
CHROMIUM   NO EXPERMENT MEAN=      3.45 DEVIATION=       .07 NUM= 2
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=       .00 NUM= 2
NICKLE     NO EXPERMENT MEAN=     33.90 DEVIATION=       .00 NUM= 2
LEAD       NO EXPERMENT MEAN=     42.45 DEVIATION=      1.91 NUM= 2
ZINC       NO EXPERMENT MEAN=      7.00 DEVIATION=       .28 NUM= 2
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     OYSTER        INTERNAL      EXPERIMENT NO=1
             DAY NUMBER    0                                                                                        12
CADMIUM   T=      .11 NOT  SIGNIFICANT EMEAN-CMEAN=     .15 DEG=  2 EMEAN=     2.65 EDEV=      .07 CMEAN=     2.50 CDEV=     1.98
CHROMIUM  T=      .37 NOT  SIGNIFICANT EMEAN-CMEAN=   -1.55 DEG=  2 EMEAN=     3.75 EDEV=     2.90 CMEAN=     5.30 CDEV=     5.09
COPPER    T=     1.30 NOT  SIGNIFICANT EMEAN-CMEAN=  204.55 DEG=  2 EMEAN=   573.05 EDEV=    57.77 CMEAN=   368.50 CDEV=   214.25
NICKLE    T=      .45 NOT  SIGNIFICANT EMEAN-CMEAN=    2.15 DEG=  2 EMEAN=    11.80 EDEV=      .85 CMEAN=     9.65 CDEV=     6.72
LEAD      T=      .19 NOT  SIGNIFICANT EMEAN-CMEAN=    1.15 DEG=  2 EMEAN=    10.75 EDEV=      .64 CMEAN=     9.60 CDEV=     8.34
ZINC      T=      .74 NOT  SIGNIFICANT EMEAN-CMEAN=  416.05 DEG=  2 EMEAN=  1315.40 EDEV=   392.87 CMEAN=   899.35 CDEV=   685.68
             DAY NUMBER    1
CADMIUM   T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    -.10 DEG=  0 EMEAN=     2.50 EDEV=      .00 CMEAN=     2.60 CDEV=      .00
CHROMIUM  T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   -2.50 DEG=  0 EMEAN=     1.70 EDEV=      .00 CMEAN=     4.20 CDEV=      .00
COPPER    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   99.30 DEG=  0 EMEAN=   220.90 EDEV=      .00 CMEAN=   121.60 CDEV=      .00
NICKLE    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    2.00 DEG=  0 EMEAN=    10.90 EDEV=      .00 CMEAN=     8.90 CDEV=      .00
LEAD      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   -1.20 DEG=  0 EMEAN=     8.80 EDEV=      .00 CMEAN=    10.00 CDEV=      .00
ZINC      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=  140.20 DEG=  0 EMEAN=  1057.00 EDEV=      .00 CMEAN=   916.80 CDEV=      .00
             DAY NUMBER    5
CADMIUM   T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    1.20 DEG=  0 EMEAN=     4.00 EDEV=      .00 CMEAN=     2.80 CDEV=      .00
CHROMIUM  T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    2.20 DEG=  0 EMEAN=     3.90 EDEV=      .00 CMEAN=     1.70 CDEV=      .00
COPPER    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN= -202.70 DEG=  0 EMEAN=    87.90 EDEV=      .00 CMEAN=   290.60 CDEV=      .00
NICKLE    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    6.10 DEG=  0 EMEAN=    13.20 EDEV=      .00 CMEAN=     7.10 CDEV=      .00
LEAD      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   30.50 DEG=  0 EMEAN=    36.20 EDEV=      .00 CMEAN=     5.70 CDEV=      .00
ZINC      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN= -622.40 DEG=  0 EMEAN=   527.60 EDEV=      .00 CMEAN=  1150.00 CDEV=      .00
             DAY NUMBER   25
CADMIUM   T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=    3.00 DEG=  0 EMEAN=     6.90 EDEV=      .00 CMEAN=     3.90 CDEV=      .00
CHROMIUM  T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=     .10 DEG=  0 EMEAN=     4.00 EDEV=      .00 CMEAN=     3.90 CDEV=      .00
COPPER    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=  257.60 DEG=  0 EMEAN=   363.90 EDEV=      .00 CMEAN=   106.30 CDEV=      .00
NICKLE    T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   23.40 DEG=  0 EMEAN=    30.90 EDEV=      .00 CMEAN=     7.50 CDEV=      .00
LEAD      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   27.80 DEG=  0 EMEAN=    33.50 EDEV=      .00 CMEAN=     5.70 CDEV=      .00
ZINC      T=      .00 NOT  SIGNIFICANT EMEAN-CMEAN=   -8.40 DEG=  0 EMEAN=   611.70 EDEV=      .00 CMEAN=   620.10 CDEV=      .00
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     OYSTER        SHELL        EXPERIMENT NO=1
            DAY NUMBER    0                                                                                            13
CADMIUM   T=    31.00  SIGN[illegible]CANT    EMEAN-CMEAN=     1.55 DEG=  2 EMEAN=      5.00 EDEV=       .00 CMEAN=      3.45 CDEV=      .07
CHROMIUM  T=      .14 NOT SIGNIFICANT EMEAN-CMEAN=      .05 DEG=  2 EMEAN=      4.40 EDEV=       .00 CMEAN=      4.35 CDEV=      .49
COPPER                  EMEAN=CMEAN                                  EMEAN=      4.45   EDEV=      00  CMEAN=      4.45CDEV=    .00
NICKLE    T=     7.00  SIGNIFICANT     EMEAN-CMEAN=    -1.75 DEG=  2 EMEAN=     34.90 EDEV=       .00 CMEAN=     36.65 CDEV=      .35
LEAD      T=     1.86 NOT SIGNIFICANT EMEAN-CMEAN=     1.85 DEG=  2 EMEAN=     42.30 EDEV=       .42 CMEAN=     40.45 CDEV=     1.34
ZINC      T=    11.14  SIGNIFICANT     EMEAN-CMEAN=    -6.30 DEG=  2 EMEAN=     13.60 EDEV=       .57 CMEAN=     19.90 CDEV=      .57
            DAY NUMBER    1
CADMIUM   T=      .63 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  2 EMEAN=      4.35 EDEV=       .07 CMEAN=      4.45 CDEV=      .21
CHROMIUM  T=     3.64 NOT SIGNIFICANT EMEAN-CMEAN=      .75 DEG=  2 EMEAN=      4.55 EDEV=       .07 CMEAN=      3.80 CDEV=      .28
COPPER                  EMEAN=CMEAN                                  EMEAN=      4.45   EDEV=     .07  CMEAN=      4.45CDEV=    .00
NICKLE    T=      .95 NOT SIGNIFICANT EMEAN-CMEAN=     -.95 DEG=  2 EMEAN=     36.95 EDEV=       .07 CMEAN=     37.90 CDEV=     1.41
LEAD      T=      .45 NOT SIGNIFICANT EMEAN-CMEAN=     -.35 DEG=  2 EMEAN=     12.65 EDEV=       .49 CMEAN=     13.00 CDEV=      .99
ZINC      T=     1.57 NCT SIGNIFICANT EMEAN-CMEAN=     1.60 DEG=  2 EMEAN=     15.40 EDEV=      1.41 CMEAN=     13.80 CDEV=      .28
            DAY NUMBER    5
CADMIUM   T=      .91 NOT SIGNIFICANT EMEAN-CMEAN=      .65 DEG=  4 EMEAN=      4.90 EDEV=       .94 CMEAN=      4.25 CDEV=      .21
CHROMIUM  T=      .25 NOT SIGNIFICANT EMEAN-CMEAN=      .15 DEG=  4 EMEAN=      4.40 EDEV=       .78 CMEAN=      4.25 CDEV=      .35
COPPER    T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.00 DEG=  4 EMEAN=      4.45 EDEV=       .00 CMEAN=      4.45 CDEV=      .00
NICKLE    T=      .05 NOT SIGNIFICANT EMEAN-CMEAN=     -.05 DEG=  2 EMEAN=     36.90 EDEV=      1.41 CMEAN=     36.95 CDEV=      .07
LEAD      T=     7.82  SIGNIFICANT     EMEAN-CMEAN=    33.30 DEG=  4 EMEAN=     46.45 EDEV=      5.66 CMEAN=     13.15 CDEV=      .78
ZINC.     T=     6.09  SIGNIFICANT     EMEAN-CMEAN=    -3.55 DEG=  4 EMEAN=      8.65 EDEV=       .76 CMEAN=     12.20 CDEV=      .28
            DAY NUMBER   25
CADMIUM   T=      .67 NOT SIGNIFICANT EMEAN-CMEAN=     5.75 DEG=  1 EMEAN=      9.70 EDEV=       .00 CMEAN=      3.95 CDEV=     2.90
CHROMIUM  T=     8.22 NOT SIGNIFICANT EMEAN-CMEAN=   128.20 DEG=  1 EMEAN=    170.70 EDEV=     12.73 CMEAN=     42.50 CDEV=      .00
COPPER    T=     1.05 NOT SIGNIFICANT EMEAN-CMEAN=   380.05 DEG=  2 EMEAN=    420.55 EDEV=    514.00 CMEAN=     40.50 CDEV=     8.20
NICKLE    T=     7.70  SIGNIFICANT     EMEAN-CMEAN=   163.35 DEG=  2 EMEAN=    204.85 EDEV=       .50 CMEAN=     41.50 CDEV=    29.98
LEAD      T=     1.28 NOT SIGNIFICANT EMEAN-CMEAN=    35.60 DEG=  2 EMEAN=     41.45 EDEV=     39.39 CMEAN=      5.85 CDEV=      .64
ZINC      T=     7.41  SIGNIFICANT     EMEAN-CMEAN=    24.90 DEG=  2 EMEAN=    102.45 EDEV=      4.60 CMEAN=     77.55 CDEV=     1.20
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      FOULING ORGANISMS         EXPERIMENT NO=1                                                                         14
              DAY NUMBER  50
CADMIUM  T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=   -1.90 DEG=  0 EMEAN=    1.70 EDEV=     .00 CMEAN=    3.60 CDEV=     .00
CHROMIUM T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=  129.90 DEG=  0 EMEAN=  209.10 EDEV=     .00 CMEAN=   79.20 CDEV=     .00
COPPER   T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=   27.30 DEG=  0 EMEAN=   82.90 EDEV=     .00 CMEAN=   55.60 CDEV=     .00
NICKLE   T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=  201.10 DEG=  0 EMEAN=  306.70 EDEV=     .00 CMEAN=  105.60 CDEV=     .00
LEAD     T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=    7.70 DEG=  0 EMEAN=   13.60 EDEV=     .00 CMEAN=    5.90 CDEV=     .00
ZINC     T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=   27.10 DEG=  0 EMEAN=  109.60 EDEV=     .00 CMEAN=   82.50 CDEV=     .00
              DAY NUMBER 125
CADMIUM  T=    15.01  SIGNIFICANT    EMEAN-CMEAN=    2.60 DEG=  1 EMEAN=    4.30 EDEV=     .00 CMEAN=    1.70 CDEV=     .14
CHROMIUM T=      .82 NOT SIGNIFICANT EMEAN-CMEAN=   -4.10 DEG=  1 EMEAN=   42.70 EDEV=     .00 CMEAN=   46.80 CDEV=    4.10
COPPER   T=    19.23  SIGNIFICANT    EMEAN-CMEAN=   33.30 DEG=  1 EMEAN=   70.30 EDEV=     .00 CMEAN=   37.00 CDEV=    1.41
NICKLE   T=  1182.41  SIGNIFICANT    EMEAN-CMEAN=   -2.00 DEG=  1 EMEAN=   69.60 EDEV=     .00 CMEAN=   71.60 CDEV=     .00
LEAD     T=    29.73  SIGNIFICANT    EMEAN-CMEAN=   10.30 DEG=  1 EMEAN=   27.60 EDEV=     .00 CMEAN=   17.30 CDEV=     .28
ZINC     T=    22.96  SIGNIFICANT    EMEAN-CMEAN=  161.05 DEG=  1 EMEAN=  224.70 EDEV=     .00 CMEAN=   63.65 CDEV=    5.73
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      SEDIMENT              EXPERIMENT NO=1                                                    16
            DAY NUMBER    0
CADMIUM                  EMEAN=CMEAN                            EMEAN=      .15  EDEV=    .00  CMEAN=      .15CDEV=    .00
CHROMIUM T=     1.41 NOT SIGNIFICANT EMEAN-CMEAN=     1.00 DEG=  2 EMEAN=     6.50 EDEV=     .71 CMEAN=     5.50 CDEV=     .71
COPPER   T=      .82 NOT SIGNIFICANT EMEAN-CMEAN=      .45 DEG=  2 EMEAN=    11.45 EDEV-     .78 CMEAN=    11.00 CDEV=     .00
NICKLE   T=     4.00 NOT SIGNIFICANT EMEAN-CMEAN=    -4.00 DEG=  2 EMEAN=     4.00 EDEV=     .00 CMEAN=     8.00 CDEV=    1.41
LEAD     T=      .37 NOT SIGNIFICANT EMEAN-CMEAN=      .95 DEG=  2 EMEAN=    14.45 EDEV=    3.61 CMEAN=    13.50 CDEV=     .71
ZINC     T=     2.09 NOT SIGNIFICANT EMEAN-CMEAN=     3.15 DEG=  2 EMEAN=    23.30 EDEV=    2.12 CMEAN=    20.15 CDEV=     .21
            DAY NUMBER    1
CADMIUM                  EMEAN=CMEAN                            EMEAN=      .15  EDEV=   2.12  CMEAN=      .15CDEV=    .00
CHROMIUM                 EMEAN=CMEAN                            EMEAN=     7.50  EDEV=   2.12  CMEAN=     7.50CDEV=    .71
COPPER   T=     1.41 NOT SIGNIFICANT EMEAN-CMEAN=     -.95 DEG=  2 EMEAN=    10.45 EDEV=     .64 CMEAN=    11.40 CDEV=     .71
NICKLE   T=     1.00 NOT SIGNIFICANT EMEAN-CMEAN=    -1.00 DEG=  2 EMEAN=     8.00 EDEV=    1.41 CMEAN=     9.00 CDEV=     .00
LEAD     T=      .01 NOT SIGNIFICANT EMEAN-CMEAN=      .05 DEG=  2 EMEAN=    14.95 EDEV=    5.59 CMEAN=    14.90 CDEV=    2.83
ZINC     T=      .26 NOT SIGNIFICANT EMEAN-CMEAN=      .25 DEG=  2 EMEAN=    20.95 EDEV=    1.34 CMEAN=    20.70 CDEV=     .00
            DAY NUMBER    5
CADMIUM                  EMEAN=CMEAN                            EMEAN=      .15  EDEV=   1.34  CMEAN=      .15CDEV=    .00
CHROMIUM T=      .45 NOT SIGNIFICANT EMEAN-CMEAN=     -.50 DEG=  2 EMEAN=     6.00 EDEV=    1.41 CMEAN=     6.50 CDEV=     .71
COPPER   T=     1.29 NOT SIGNIFICANT EMEAN-CMEAN=    -1.00 DEG=  2 EMEAN=    10.45 EDEV=     .78 CMEAN=    11.45 CDEV=     .78
NICKLE   T=     1.40 NOT SIGNIFICANT EMEAN-CMEAN=    -3.55 DEG=  2 EMEAN=     5.50 EDEV=    2.12 CMEAN=     9.05 CDEV=    2.90
LEAD     T=     1.73 NOT SIGNIFICANT EMEAN-CMEAN=    -4.95 DEG=  2 EMEAN=    12.95 EDEV=    2.90 CMEAN=    17.90 CDEV=    2.83
ZINC     T=     2.57 NOT SIGNIFICANT EMEAN-CMEAN=    -2.75 DEG=  2 EMEAN=    18.15 EDEV=    1.48 CMEAN=    20.90 CDEV=     .28
            DAY NUMBER   25
CADMIUM  T=     1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -.22 DEG=  2 EMEAN=      .15 EDEV=     .00 CMEAN=      .37 CDEV=     .32
CHROMIUM T=      .47 NOT SIGNIFICANT EMEAN-CMEAN=     -.55 DEG=  2 EMEAN=     6.95 EDEV=    1.48 CMEAN=     7.50 CDEV=     .71
COPPER   T=      .05 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  2 EMEAN=    10.45 EDEV=     .64 CMEAN=    10.17 CDEV=    8.10
NICKLE   T=     3.71 NOT SIGNIFICANT EMEAN-CMEAN=    -3.90 DEG=  2 EMEAN=     6.95 EDEV=     .07 CMEAN=    10.85 CDEV=    1.48
LEAD     T=      .43 NOT SIGNIFICANT EMEAN-CMEAN=    -3.05 DEG=  2 EMEAN=    13.90 EDEV=    1.41 CMEAN=    16.95 CDEV=    9.83
ZINC     T=      .59 NOT SIGNIFICANT EMEAN-CMEAN=    -1.50 DEG=  2 EMEAN=    19.65 EDEV=    1.34 CMEAN=    21.15 CDEV=    3.32
            DAY NUMBER   50
CADMIUM  T=      .97 NOT SIGNIFICANT EMEAN-CMEAN=    -1.45 DEG=  2 EMEAN=      .65 EDEV=     .07 CMEAN=     2.10 CDEV=    2.12
CHROMIUM T=     1.79 NOT SIGNIFICANT EMEAN-CMEAN=     1.70 DEG=  2 EMEAN=     7.20 EDEV=     .42 CMEAN=     5.50 CDEV=    1.27
COPPER                   EMEAN=CMEAN                            EMEAN=     4.45  EDEV=    .02  CMEAN=     4.45CDEV=    .00
NICKLE   T=      .74 NOT SIGNIFICANT EMEAN-CMEAN=    -3.50 DEG=  2 EMEAN=     9.40 EDEV=     .28 CMEAN=    12.90 CDEV=    6.65
LEAD     T=      .00 NOT SIGNIFICANT EMEAN-CMEAN=      .00 DEG=  2 EMEAN=    10.00 EDEV=     .00 CMEAN=    10.00 CDEV=     .28
ZINC     T=     1.41 NOT SIGNIFICANT EMEAN-CMEAN=     -.85 DEG=  2 EMEAN=    18.40 EDEV=     .57 CMEAN=    19.25 CDEV=     .64
            DAY NUMBER  125
CADMIUM  T=     2.61 NOT SIGNIFICANT EMEAN-CMEAN=    -2.45 DEG=  2 EMEAN=     1.95 EDEV=    1.20 CMEAN=     4.40 CDEV=     .57
CHROMIUM T=      .81 NOT SIGNIFICANT EMEAN-CMEAN=    -1.20 DEG=  2 EMEAN=    10.70 EDEV=    1.41 CMEAN=    11.90 CDEV=    1.56
COPPER   T=     1.56 NOT SIGNIFICANT EMEAN-CMEAN=    -1.05 DEG=  2 EMEAN=    10.45 EDEV=     .64 CMEAN=    11.50 CDEV=     .71
NICKLE   T=      .04 NOT SIGNIFICANT EMEAN-CMEAN=     -.05 DEG=  2 EMEAN=    16.90 EDEV=    1.41 CMEAN=    16.95 CDEV=    1.34
LEAD     T=      .83 NOT SIGNIFICANT EMEAN-CMEAN=     1.40 DEG=  2 EMEAN=    11.95 EDEV=    2.05 CMEAN=    10.55 CDEV=    1.20
ZINC     T=     1.25 NOT SIGNIFICANT EMEAN-CMEAN=    -3.50 DEG=  2 EMEAN=    18.25 EDEV=    1.63 CMEAN=    21.75 CDEV=    3.61
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    THALASSL      LEAF          EXPERIMENT NO=1                                                                                17
            DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=      1.65 DEVIATION=      1.30 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=      1.70 DEVIATION=       .00 NUM= 3
COPPER     NO EXPERMENT MEAN=     14.03 DEVIATION=      1.53 NUM= 3
NICKLE     NO EXPERMENT MEAN=      9.05 DEVIATION=      7.46 NUM= 3
LEAD       NO EXPERMENT MEAN=     11.50 DEVIATION=      2.04 NUM= 3
ZINC       NO EXPERMENT MEAN=     36.63 DEVIATION=      9.32 NUM= 3
            DAY NUMBER    1
CADMIUM   T=      .33 NOT SIGNIFICANT EMEAN-CMEAN=     -.22 DEG=  6 EMEAN=      3.00 EDEV=      1.05 CMEAN=      3.22 CDEV=       .84
CHROMIUM  T=     3.11  SIGNIFICANT    EMEAN-CMEAN=     8.18 DEG=  6 EMEAN=     27.65 EDEV=      3.81 CMEAN=     19.47 CDEV=      3.63
COPPER    T=    10.76  SIGNIFICANT    EMEAN-CMEAN=     6.47 DEG=  6 EMEAN=     21.27 EDEV=       .85 CMEAN=     14.80 CDEV=       .85
NICKLE    T=     2.99  SIGNIFICANT    EMEAN-CMEAN=    11.67 DEG=  6 EMEAN=     50.15 EDEV=      7.28 CMEAN=     38.47 CDEV=      2.85
LEAD      T=    12.16  SIGNIFICANT    EMEAN-CMEAN=    17.15 DEG=  6 EMEAN=     32.02 EDEV=      2.30 CMEAN=     14.87 CDEV=      1.64
ZINC      T=     4.65  SIGNIFICANT    EMEAN-CMEAN=    10.32 DEG=  6 EMEAN=     50.30 EDEV=      3.74 CMEAN=     39.97 CDEV=      2.40
            DAY NUMBER    5
CADMIUM   T=      .50 NOT SIGNIFICANT EMEAN-CMEAN=      .42 DEG=  5 EMEAN=      2.62 EDEV=      1.16 CMEAN=      2.20 CDEV=      1.01
CHROMIUM  T=     2.51 NOT SIGNIFICANT EMEAN-CMEAN=    -7.48 DEG=  5 EMEAN=     25.72 EDEV=      2.57 CMEAN=     33.20 CDEV=      5.30
COPPER    T=     4.95  SIGNIFICANT    EMEAN-CMEAN=     7.62 DEG=  5 EMEAN=     22.82 EDEV=      2.05 CMEAN=     15.20 CDEV=      1.97
NICKLE    T=     1.82 NOT SIGNIFICANT EMEAN-CMEAN=    -2.35 DEG=  4 EMEAN=     44.25 EDEV=      1.72 CMEAN=     46.60 CDEV=       .28
LEAD      T=     3.86  SIGNIFICANT    EMEAN-CMEAN=    10.61 DEG=  5 EMEAN=     31.07 EDEV=       .98 CMEAN=     20.47 CDEV=      5.56
ZINC      T=     7.78  SIGNIFICANT    EMEAN-CMEAN=    10.27 DEG=  3 EMEAN=     45.97 EDEV=      1.20 CMEAN=     35.70 CDEV=      1.84
            DAY NUMBER   25
CADMIUM   T=      .85 NOT SIGNIFICANT EMEAN-CMEAN=    -2.24 DEG=  6 EMEAN=      4.04 EDEV=      4.42 CMEAN=      6.27 CDEV=      2.87
CHROMIUM  T=     4.55  SIGNIFICANT    EMEAN-CMEAN=    33.15 DEG=  2 EMEAN=     65.60 EDEV=      3.11 CMEAN=     32.45 CDEV=      9.83
COPPER    T=     3.2       SIGNIFICANT EMEAN-CMEAN=   12.85 DEG=  3 EMEAN=     27.05 EDEV=      4.71 CMEAN=     14.2  CDEV=      0.0
NICKLE    T=     2.19 NOT SIGNIFICANT EMEAN-CMEAN=    15.60 DEG=  4 EMEAN=     47.50 EDEV=      9.50 CMEAN=     31.90 CDEV=       .99
LEAD      T=     6.87  SIGNIFICANT    EMEAN-CMEAN=    18.80 DEG=  5 EMEAN=     35.60 EDEV=      3.92 CMEAN=     16.80 CDEV=      3.00
ZINC      T=     3.31  SIGNIFICANT    EMEAN-CMEAN=    -4.45 DEG=  5 EMEAN=     28.70 EDEV=      1.47 CMEAN=     33.15 CDEV=      2.05
            DAY NUMBER   50
CADMIUM   T=     4.81  SIGNIFICANT    EMEAN-CMEAN=    -5.43 DEG=  4 EMEAN=      4.70 EDEV=      1.14 CMEAN=     10.13 CDEV=      1.59
CHROMIUM  T=    15.48  SIGNIFICANT    EMEAN-CMEAN=    58.73 DEG=  3 EMEAN=     94.60 EDEV=      5.66 CMEAN=     35.87 CDEV=      3.15
COPPER    T=     7.01  SIGNIFICANT    EMEAN-CMEAN=    37.23 DEG=  4 EMEAN=     59.73 EDEV=      8.73 CMEAN=     22.50 CDEV=      2.91
NICKLE    T=     4.29  SIGNIFICANT    EMEAN-CMEAN=    27.90 DEG=  4 EMEAN=     70.70 EDEV=     10.15 CMEAN=     42.80 CDEV=      4.90
LEAD      T=    22.24  SIGNIFICANT    EMEAN-CMEAN=    77.08 DEG=  3 EMEAN=     95.33 EDEV=      4.38 CMEAN=     18.25 CDEV=      2.19
ZINC      T=     9.24  SIGNIFICANT    EMEAN-CMEAN=    25.90 DEG=  2 EMEAN=     54.70 EDEV=      2.26 CMEAN=     28.80 CDEV=      3.25
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     THALASSL      ROOT          EXPERIMENT NO=1                                                                 18
             DAY NUMBER    0
   CADMIUM    NO EXPERMENT MEAN=       .15 DEVIATION=      .00 NUM= 2
   CHROMIUM   NO EXPERMENT MEAN=      5.00 DEVIATION=     1.27 NUM= 2
   COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=      .00 NUM= 2
   NICKLE     NO EXPERMENT MEAN=       .45 DEVIATION=      .00 NUM= 2
   LEAD       NO EXPERMENT MEAN=     15.50 DEVIATION=      .00 NUM= 2
   ZINC       NO EXPERMENT MEAN=     25.40 DEVIATION=     2.55 NUM= 2
             DAY NUMBER    1
   CADMIUM   T=        .67 NOT SIGNIFICANT EMEAN-CMEAN=     -.84 DEG=  4 EMEAN=     1.15 EDEV=      .21 CMEAN=     1.99 CDEV=     1.67
   CHROMIUM  T=       1.30 NOT SIGNIFICANT EMEAN-CMEAN=     5.00 DEG=  4 EMEAN=    26.15 EDEV=     1.77 CMEAN=    21.15 CDEV=     5.04
   COPPER    T=       6.57  SIGNIFICANT    EMEAN-CMEAN=     3.48 DEG=  4 EMEAN=    15.85 EDEV=      .21 CMEAN=    12.37 CDEV=      .69
   NICKLE    T=       7.61  SIGNIFICANT    EMEAN-CMEAN=    13.92 DEG=  4 EMEAN=    43.50 EDEV=     3.68 CMEAN=    29.57 CDEV=     1.20
   LEAD      T=      11.71  SIGNIFICANT    EMEAN-CMEAN=     7.87 DEG=  4 EMEAN=    28.65 EDEV=      .35 CMEAN=    20.77 CDEV=      .87
   ZINC      T=       1.02 NOT SIGNIFICANT EMEAN-CMEAN=     2.20 DEG=  4 EMEAN=    34.15 EDEV=     1.63 CMEAN=    31.95 CDEV=     2.71
             DAY NUMBER    5
   CADMIUM   T=       1.75 NOT SIGNIFICANT EMEAN-CMEAN=    -1.16 DEG=  6 EMEAN=     1.84 EDEV=     1.29 CMEAN=     3.00 CDEV=      .32
   CHROMIUM  T=       0.04 NOT SIGNIFICANT EMEAN-CMEAN=     3.00 DEG=  4 EMEAN=    32.83 EDEV=      .12 CMEAN=    29.83 CDEV=     1.00
   COPPER    T=        .73 NOT SIGNIFICANT EMEAN-CMEAN=     -.67 DEG=  6 EMEAN=    14.10 EDEV=     1.31 CMEAN=    14.77 CDEV=     1.29
   NICKLE    T=       1.81 NOT SIGNIFICANT EMEAN-CMEAN=     3.78 DEG=  6 EMEAN=    46.45 EDEV=     3.30 CMEAN=    42.67 CDEV=     2.55
   LEAD      T=       4.80  SIGNIFICANT    EMEAN-CMEAN=     9.45 DEG=  4 EMEAN=    27.30 EDEV=     3.34 CMEAN=    17.85 CDEV=     2.90
   ZINC      T=       1.21 NOT SIGNIFICANT EMEAN-CMEAN=    -2.22 DEG=  6 EMEAN=    34.62 EDEV=     3.06 CMEAN=    36.85 CDEV=     2.04
             DAY NUMBER   25
   CADMIUM   T=        .33 NOT SIGNIFICANT EMEAN-CMEAN=     -.18 DEG=  6 EMEAN=     1.67 EDEV=      .64 CMEAN=     1.85 CDEV=      .86
   CHROMIUM  T=       3.18  SIGNIFICANT    EMEAN-CMEAN=    12.62 DEG=  6 EMEAN=    40.02 EDEV=     5.20 CMEAN=    27.40 CDEV=     6.00
   COPPER    T=       2.79  SIGNIFICANT    EMEAN-CMEAN=     5.82 DEG=  6 EMEAN=    19.12 EDEV=     3.74 CMEAN=    13.30 CDEV=     1.85
   NICKLE    T=       4.64  SIGNIFICANT    EMEAN-CMEAN=    11.72 DEG=  5 EMEAN=    45.95 EDEV=     3.45 CMEAN=    34.23 CDEV=     3.07
   LEAD      T=        .06 NOT SIGNIFICANT EMEAN-CMEAN=     -.13 DEG=  6 EMEAN=    22.10 EDEV=     1.97 CMEAN=    22.22 CDEV=     3.30
   ZINC      T=       1.43 NOT SIGNIFICANT EMEAN-CMEAN=     5.97 DEG=  6 EMEAN=    34.37 EDEV=     8.19 CMEAN=    28.40 CDEV=     1.50
             DAY NUMBER   50
   CADMIUM   T=        .34 NOT SIGNIFICANT EMEAN-CMEAN=      .10 DEG=  4 EMEAN=     2.40 EDEV=      .38 CMEAN=     2.30 CDEV=      .14
   CHROMIUM  T=       3.53  SIGNIFICANT    EMEAN-CMEAN=    25.67 DEG=  4 EMEAN=    54.32 EDEV=     9.68 CMEAN=    28.65 CDEV=     1.06
   COPPER    T=       5.68  SIGNIFICANT    EMEAN-CMEAN=    16.97 DEG=  4 EMEAN=    30.92 EDEV=     3.49 CMEAN=    13.95 CDEV=     3.32
   NICKLE    T=       4.42  SIGNIFICANT    EMEAN-CMEAN=    16.03 DEG=  4 EMEAN=    50.37 EDEV=     4.81 CMEAN=    34.35 CDEV=      .78
   LEAD      T=       8.36  SIGNIFICANT    EMEAN-CMEAN=    32.25 DEG=  4 EMEAN=    44.45 EDEV=     5.14 CMEAN=    12.20 CDEV=      .14
   ZINC      T=       1.69 NOT SIGNIFICANT EMEAN-CMEAN=     9.30 DEG=  4 EMEAN=    37.15 EDEV=     7.15 CMEAN=    27.85 CDEV=     2.76
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     URCHIN         INTERNAL      EXPERIMENT NO=1                                                                    19
            DAY NUMBER    0
CADMIUM   T=        .14 NOT SIGNIFICANT  EMEAN-CMEAN=        .21 DEG=  4 EMEAN=     2.26 EDEV=      1.98 CMEAN=     2.05 CDEV=       .21
CHROMIUM  T=       7.54  SIGNIFICANT     EMEAN-CMEAN=     -12.40 DEG=  4 EMEAN=     3.20 EDEV=      1.76 CMEAN=    15.60 CDEV=      2.26
COPPER    T=       3.56  SIGNIFICANT     EMEAN-CMEAN=      -6.04 DEG=  4 EMEAN=     5.56 EDEV=      2.22 CMEAN=    11.60 CDEV=       .71
NICKLE    T=      10.58  SIGNIFICANT     EMEAN-CMEAN=     -19.97 DEG=  4 EMEAN=    16.42 EDEV=      2.48 CMEAN=    36.40 CDEV=       .71
LEAD      T=       3.06  SIGNIFICANT     EMEAN-CMEAN=      -4.33 DEG=  4 EMEAN=    13.62 EDEV=      1.00 CMEAN=    17.95 CDEV=      2.76
ZINC      T=        .49 NOT SIGNIFICANT  EMEAN-CMEAN=      -1.75 DEG=  4 EMEAN=    46.40 EDEV=      4.81 CMEAN=    48.15 CDEV=       .07
            DAY NUMBER    1
CADMIUM   T=       1.00 NOT SIGNIFICANT  EMEAN-CMEAN=      -1.77 DEG=  2 EMEAN=      .15 EDEV=       .00 CMEAN=     1.92 CDEV=      2.51
CHROMIUM  T=        .16 NOT SIGNIFICANT  EMEAN-CMEAN=        .10 DEG=  2 EMEAN=     9.85 EDEV=       .64 CMEAN=     9.75 CDEV=       .64
COPPER    T=       1.80 NOT SIGNIFICANT  EMEAN-CMEAN=       4.62 DEG=  2 EMEAN=    11.65 EDEV=       .07 CMEAN=     7.02 CDEV=      3.64
NICKLE    T=       2.03 NOT SIGNIFICANT  EMEAN-CMEAN=      -3.75 DEG=  2 EMEAN=    21.40 EDEV=       .00 CMEAN=    25.15 CDEV=      2.62
LEAD      T=        .97 NOT SIGNIFICANT  EMEAN-CMEAN=      -1.80 DEG=  2 EMEAN=    17.75 EDEV=      2.33 CMEAN=    19.55 CDEV=      1.20
ZINC      T=       8.64  SIGNIFICANT     EMEAN-CMEAN=      16.50 DEG=  2 EMEAN=    61.20 EDEV=      2.69 CMEAN=    44.70 CDEV=       .28
            DAY NUMBER    5
CADMIUM   T=       2.04 NOT SIGNIFICANT  EMEAN-CMEAN=      -2.37 DEG=  4 EMEAN=     1.07 EDEV=      1.31 CMEAN=     3.45 CDEV=      1.35
CHROMIUM  T=       2.79  SIGNIFICANT     EMEAN-CMEAN=       1.83 DEG=  4 EMEAN=    12.90 EDEV=      1.41 CMEAN=    11.07 CDEV=       .31
COPPER    T=       1.64 NOT SIGNIFICANT  EMEAN-CMEAN=       4.74 DEG=  4 EMEAN=    13.90 EDEV=      2.83 CMEAN=     9.16 CDEV=      3.50
NICKLE    T=       4.75  SIGNIFICANT     EMEAN-CMEAN=      13.10 DEG=  4 EMEAN=    39.75 EDEV=       .07 CMEAN=    26.65 CDEV=      3.60
LEAD      T=       6.13  SIGNIFICANT     EMEAN-CMEAN=      10.60 DEG=  4 EMEAN=    28.20 EDEV=      1.13 CMEAN=    17.60 CDEV=      2.21
ZINC      T=      12.65  SIGNIFICANT     EMEAN-CMEAN=      36.27 DEG=  4 EMEAN=    72.00 EDEV=      3.39 CMEAN=    35.72 CDEV=      3.28
            DAY NUMBER   25
CADMIUM   T=        .19 NOT SIGNIFICANT  EMEAN-CMEAN=       -.20 DEG=  6 EMEAN=     4.37 EDEV=      1.50 CMEAN=     4.57 CDEV=      1.42
CHROMIUM  T=       4.78  SIGNIFICANT     EMEAN-CMEAN=      13.25 DEG=  6 EMEAN=    24.97 EDEV=      5.02 CMEAN=    11.72 CDEV=      2.35
COPPER    T=       3.39  SIGNIFICANT     EMEAN-CMEAN=       8.27 DEG=  6 EMEAN=    22.00 EDEV=      2.76 CMEAN=    13.72 CDEV=      4.02
NICKLE    T=       6.16  SIGNIFICANT     EMEAN-CMEAN=      16.85 DEG=  5 EMEAN=    39.55 EDEV=      4.59 CMEAN=    22.70 CDEV=       .70
LEAD      T=      18.72  SIGNIFICANT     EMEAN-CMEAN=      21.90 DEG=  6 EMEAN=    38.60 EDEV=      1.31 CMEAN=    16.70 CDEV=      1.94
ZINC      T=      12.75  SIGNIFICANT     EMEAN-CMEAN=      43.50 DEG=  6 EMEAN=    90.90 EDEV=      3.51 CMEAN=    47.40 CDEV=      5.85
            DAY NUMBER   50
CADMIUM   T=       3.43  SIGNIFICANT     EMEAN-CMEAN=      -1.72 DEG=  4 EMEAN=     2.30 EDEV=       .14 CMEAN=     4.02 CDEV=       .67
CHROMIUM  T=       1.82 NOT SIGNIFICANT  EMEAN-CMEAN=       4.80 DEG=  4 EMEAN=    36.50 EDEV=       .14 CMEAN=    31.70 CDEV=      3.53
COPPER    T=       6.42  SIGNIFICANT     EMEAN-CMEAN=       7.53 DEG=  4 EMEAN=    25.95 EDEV=      1.98 CMEAN=    18.42 CDEV=      1.31
NICKLE    T=       2.73 NOT SIGNIFICANT  EMEAN-CMEAN=       8.10 DEG=  4 EMEAN=    55.85 EDEV=      2.90 CMEAN=    47.75 CDEV=      3.58
LEAD      T=      10.95  SIGNIFICANT     EMEAN-CMEAN=      11.00 DEG=  4 EMEAN=    31.10 EDEV=      2.26 CMEAN=    20.10 CDEV=       .29
ZINC      T=       7.51      SIGNIFICANT EMEAN-CMEAN=      17.4   DEG=  2 EMEAN=    94.75 EDEV=      2.90 CMEAN=    77.35  CDEV=     0.071
            DAY NUMBER  125
CADMIUM   T=       1.28 NOT SIGNIFICANT  EMEAN-CMEAN=      -1.03 DEG=  8 EMEAN=     3.82 EDEV=      1.07 CMEAN=     4.85 CDEV=      1.51
CHROMIUM  T=      11.99  SIGNIFICANT     EMEAN-CMEAN=      12.57 DEG=  8 EMEAN=    20.32 EDEV=      1.92 CMEAN=     7.75 CDEV=       .95
COPPER    T=       7.59  SIGNIFICANT     EMEAN-CMEAN=      15.61 DEG=  8 EMEAN=    21.20 EDEV=      3.63 CMEAN=     5.59 CDEV=      2.28
NICKLE    T=       2.51  SIGNIFICANT     EMEAN-CMEAN=       5.16 DEG=  8 EMEAN=    22.83 EDEV=      3.86 CMEAN=    17.67 CDEV=      1.48
LEAD      T=      19.08  SIGNIFICANT     EMEAN-CMEAN=      29.92 DEG=  8 EMEAN=    50.27 EDEV=      3.04 CMEAN=    20.35 CDEV=       .57
ZINC      T=       7.24  SIGNIFICANT     EMEAN-CMEAN=      69.26 DEG=  8 EMEAN=   180.73 EDEV=     14.83 CMEAN=   111.47 CDEV=     14.81
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     URCHIN          SHELL          EXPERIMENT NO=1
          DAY NUMBER    0                                                                                   20
 CADMIUM  T=        .87 NOT SIGNIFICANT EMEAN-CMEAN=    -1.47 DEG=  2 EMEAN=    1.82 EDEV=    2.37 CMEAN=    3.30 CDEV=     .28
 CHROMIUM T=        .78 NOT SIGNIFICANT EMEAN-CMEAN=     -.20 DEG=  2 EMEAN=    4.65 EDEV=     .35 CMEAN=    4.85 CDEV=     .07
 COPPER                 EMEAN=CMEAN                                   EMEAN=    4.45  EDEV=   .35  CMEAN=    4.45CDEV=    .00
 NICKLE   T=       1.03 NOT SIGNIFICANT EMEAN-CMEAN=   -10.95 DEG=  2 EMEAN=   11.65 EDEV=   15.06 CMEAN=   22.60 CDEV=     .42
 LEAD     T=        .14 NOT SIGNIFICANT EMEAN-CMEAN=     1.20 DEG=  2 EMEAN=   43.70 EDEV=   12.45 CMEAN=   42.50 CDEV=     .71
 ZINC     T=       1.29 NOT SIGNIFICANT EMEAN-CMEAN=     -.55 DEG=  2 EMEAN=   11.45 EDEV=     .21 CMEAN=   12.00 CDEV=     .57
          DAY NUMBER    1
 CADMIUM  T=       2.08 NOT SIGNIFICANT EMEAN-CMEAN=     3.70 DEG=  5 EMEAN=    3.85 EDEV=    2.37 CMEAN=     .15 CDEV=     .00
 CHROMIUM T=        .86 NOT SIGNIFICANT EMEAN-CMEAN=     -.80 DEG=  5 EMEAN=    3.00 EDEV=    1.24 CMEAN=    3.80 CDEV=     .00
 COPPER   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.00 DEG=  5 EMEAN=    4.45 EDEV=     .00 CMEAN=    4.45 CDEV=     .00
 NICKLE   T=       1.74 NOT SIGNIFICANT EMEAN-CMEAN=     6.90 DEG=  5 EMEAN=   10.10 EDEV=    5.28 CMEAN=    3.20 CDEV=     .99
 LEAD     T=       2.36 NOT SIGNIFICANT EMEAN-CMEAN=   -18.39 DEG=  5 EMEAN=   44.66 EDEV=   10.37 CMEAN=   63.05 CDEV=    1.48
 ZINC     T=        .51 NOT SIGNIFICANT EMEAN-CMEAN=     3.09 DEG=  5 EMEAN=   15.54 EDEV=    8.11 CMEAN=   12.45 CDEV=     .07
          DAY NUMBER    5
 CADMIUM  T=       1.92 NOT SIGNIFICANT EMEAN-CMEAN=    -3.54 DEG=  4 EMEAN=     .15 EDEV=     .00 CMEAN=    3.69 CDEV=    2.46
 CHROMIUM T=       3.74  SIGNIFICANT    EMEAN-CMEAN=     3.00 DEG=  4 EMEAN=    5.60 EDEV=     .42 CMEAN=    2.60 CDEV=    1.04
 COPPER   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=      .00 DEG=  4 EMEAN=    4.45 EDEV=     .00 CMEAN=    4.45 CDEV=     .00
 NICKLE   T=       1.68 NOT SIGNIFICANT EMEAN-CMEAN=   -14.35 DEG=  4 EMEAN=    4.60 EDEV=     .85 CMEAN=   18.95 CDEV=   11.38
 LEAD     T=       3.53  SIGNIFICANT    EMEAN-CMEAN=    13.55 DEG=  4 EMEAN=   56.35 EDEV=     .21 CMEAN=   42.80 CDEV=    5.12
 ZINC     T=       1.09 NOT SIGNIFICANT EMEAN-CMEAN=     1.75 DEG=  4 EMEAN=   11.55 EDEV=    1.63 CMEAN=    9.80 CDEV=    1.92
          DAY NUMBER   25
 CADMIUM  T=        .33 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  2 EMEAN=    3.90 EDEV=     .00 CMEAN=    4.00 CDEV=     .42
 CHROMIUM T=        .89 NOT SIGNIFICANT EMEAN-CMEAN=      .85 DEG=  2 EMEAN=    3.50 EDEV=     .00 CMEAN=    2.65 CDEV=    1.34
 COPPER                 EMEAN=CMEAN                                   EMEAN=    4.45  EDEV=   .00  CMEAN=    4.45CDEV=    .00
 NICKLE   T=        .55 NOT SIGNIFICANT EMEAN-CMEAN=    -1.45 DEG=  2 EMEAN=   31.90 EDEV=    1.41 CMEAN=   33.35 CDEV=    3.46
 LEAD     T=       2.47 NOT SIGNIFICANT EMEAN-CMEAN=     1.80 DEG=  2 EMEAN=   12.10 EDEV=     .99 CMEAN=   10.30 CDEV=     .28
 ZINC     T=       5.01  SIGNIFICANT    EMEAN-CMEAN=    -2.70 DEG=  2 EMEAN=   10.50 EDEV=     .71 CMEAN=   13.20 CDEV=     .28
          DAY NUMBER   50
 CADMIUM  T=       2.83 NOT SIGNIFICANT EMEAN-CMEAN=     -.60 DEG=  2 EMEAN=    4.25 EDEV=     .21 CMEAN=    4.85 CDEV=     .21
 CHROMIUM T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=      .05 DEG=  2 EMEAN=    6.55 EDEV=     .07 CMEAN=    6.50 CDEV=     .00
 COPPER                 EMEAN=CMEAN                                   EMEAN=    4.45  EDEV=   .07  CMEAN=    4.45CDEV=    .00
 NICKLE   T=        .46 NOT SIGNIFICANT EMEAN-CMEAN=     -.50 DEG=  2 EMEAN=   28.35 EDEV=     .78 CMEAN=   28.85 CDEV=    1.34
 LEAD     T=        .23 NOT SIGNIFICANT EMEAN-CMEAN=     -.55 DEG=  2 EMEAN=   57.60 EDEV=     .00 CMEAN=   58.35 CDEV=    3.32
 ZINC                   EMEAN=CMEAN                                   EMEAN=   15.40  EDEV=   .00  CMEAN=   15.40CDEV=    .71
          DAY NUMBER  125
 CADMIUM  T=       1.26 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  2 EMEAN=    4.75 EDEV=     .07 CMEAN=    4.55 CDEV=     .21
 CHROMIUM T=   10022.40  SIGNIFICANT    EMEAN-CMEAN=     1.10 DEG=  2 EMEAN=    6.50 EDEV=     .00 CMEAN=    5.40 CDEV=     .00
 COPPER                 EMEAN=CMEAN                                   EMEAN=    4.45  EDEV=   .00  CMEAN=    4.45CDEV=    .00
 NICKLE   T=        .90 NOT SIGNIFICANT EMEAN-CMEAN=      .95 DEG=  2 EMEAN=   27.90 EDEV=     .14 CMEAN=   26.95 CDEV=    1.48
 LEAD     T=       8.84  SIGNIFICANT    EMEAN-CMEAN=     6.75 DEG=  2 EMEAN=   58.35 EDEV=     .92 CMEAN=   51.60 CDEV=     .57
 ZINC     T=      13.50  SIGNIFICANT    EMEAN-CMEAN=     2.70 DEG=  2 EMEAN=   16.20 EDEV=     .28 CMEAN=   13.50 CDEV=     .00
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      ZOOPLANK      SOLIDS        EXPERIMENT NO=1                                                                          21
                 DAY NUMBER   25
   CADMIUM   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.80 DEG=  0 EMEAN=     4.90 EDEV=         .00 CMEAN=     5.70 CDEV=          .00
   CHROMIUM  T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=   -75.40 DEG=  0 EMEAN=   185.40 EDEV=         .00 CMEAN=   260.80 CDEV=          .00
   COPPER    T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=   -15.10 DEG=  0 EMEAN=    74.60 EDEV=         .00 CMEAN=    89.70 CDEV=          .00
   NICKLE    T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=   -46.30 DEG=  0 EMEAN=   201.80 EDEV=         .00 CMEAN=   248.10 CDEV=          .00
   LEAD      T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=      .40 DEG=  0 EMEAN=    15.70 EDEV=         .00 CMEAN=    15.30 CDEV=          .00
   ZINC      T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=    59.70 DEG=  0 EMEAN=   126.70 EDEV=         .00 CMEAN=    67.00 CDEV=          .00
                 DAY NUMBER   50
   CADMIUM   T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.60 DEG=  0 EMEAN=     2.30 EDEV=         .00 CMEAN=     2.90 CDEV=          .00
   CHROMIUM  T=       1.34 NOT SIGNIFICANT EMEAN-CMEAN=  -153.90 DEG=  1 EMEAN=    10.00 EDEV=         .00 CMEAN=   163.90 CDEV=        93.90
   COPPER    T=       1.37 NOT SIGNIFICANT EMEAN-CMEAN=   -40.95 DEG=  1 EMEAN=    19.20 EDEV=         .00 CMEAN=    60.15 CDEV=        24.40
   NICKLE    T=       1.29 NOT SIGNIFICANT EMEAN-CMEAN=  -115.20 DEG=  1 EMEAN=    49.50 EDEV=         .00 CMEAN=   164.70 CDEV=        72.97
   LEAD      T=   32942.04   SIGNIFICANT   EMEAN-CMEAN=   -39.40 DEG=  1 EMEAN=     7.80 EDEV=         .00 CMEAN=    47.20 CDEV=          .00
   ZINC      T=        .00 NOT SIGNIFICANT EMEAN-CMEAN=   -16.40 DEG=  0 EMEAN=    30.40 EDEV=         .00 CMEAN=    46.80 CDEV=          .00
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       CLAM           INTERNAL       EXPERIMENT NO=2
              DAY NUMBER    0                                                                       22
CADMIUM   NO EXPERMENT MEAN=      2.13 DEVIATION=       .12 NUM= 3
CHROMIUM  NO EXPERMENT MEAN=      3.73 DEVIATION=       .12 NUM= 3
COPPER    NO EXPERMENT MEAN=     21.83 DEVIATION=      1.10 NUM= 3
NICKLE    NO EXPERMENT MEAN=      6.80 DEVIATION=       .36 NUM= 3
LEAD      NO EXPERMENT MEAN=      3.72 DEVIATION=      3.04 NUM= 3
ZINC      NO EXPERMENT MEAN=    119.70 DEVIATION=      7.30 NUM= 3
              DAY NUMBER    1
CADMIUM   T=       .35 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     1.13 EDEV=      .06 CMEAN=       .17 CDEV=      .15
CHROMIUM                  EMEAN=CMEAN                            EMEAN=     1.70  EDEV=     .06  CMEAN=     1.70CDEV=     .00
COPPER    T=     10.56  SIGNIFICANT    EMEAN-CMEAN=    -7.33 DEG=  4 EMEAN=    20.13 EDEV=      .76 CMEAN=     27.47 CDEV=      .93
NICKLE    T=      1.44 NOT SIGNIFICANT EMEAN-CMEAN=     -.30 DEG=  4 EMEAN=     5.80 EDEV=      .20 CMEAN=      6.10 CDEV=      .30
LEAD      T=       .63 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  4 EMEAN=     4.27 EDEV=      .64 CMEAN=      4.00 CDEV=      .36
ZINC      T=     14.29  SIGNIFICANT    EMEAN-CMEAN=    42.87 DEG=  4 EMEAN=   150.50 EDEV=     2.60 CMEAN=    107.63 CDEV=     4.50
              DAY NUMBER    5
CADMIUM   T=      1.26 NOT SIGNIFICANT EMEAN-CMEAN=     -.37 DEG=  4 EMEAN=     1.33 EDEV=      .25 CMEAN=      1.70 CDEV=      .44
CHROMIUM  T=       .11 NOT SIGNIFICANT EMEAN-CMEAN=      .13 DEG=  4 EMEAN=     3.47 EDEV=     1.59 CMEAN=      3.33 CDEV=     1.46
COPPER    T=      2.50 NOT SIGNIFICANT EMEAN-CMEAN=     6.90 DEG=  4 EMEAN=    23.07 EDEV=     4.45 CMEAN=     16.17 CDEV=     1.74
NICKLE    T=      1.80 NOT SIGNIFICANT EMEAN-CMEAN=      .77 DEG=  4 EMEAN=     5.20 EDEV=      .53 CMEAN=      4.43 CDEV=      .51
LEAD      T=       .69 NOT SIGNIFICANT EMEAN-CMEAN=     1.13 DEG=  4 EMEAN=     6.37 EDEV=      .98 CMEAN=      5.23 CDEV=     2.68
ZINC      T=      1.74 NOT SIGNIFICANT EMEAN-CMEAN-    30.07 DEG=  4 EMEAN=   119.47 EDEV=    12.23 CMEAN=     89.40 CDEV=    27.37
              DAY NUMBER   25
CADMIUM   T=      2.14 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  4 EMEAN=     1.83 EDEV=      .21 CMEAN=      1.57 CDEV=      .06
CHROMIUM  T=      4.00  SIGNIFICANT    EMEAN-CMEAN=     -.80 DEG=  4 EMEAN=     4.00 EDEV=      .35 CMEAN=      4.80 CDEV=      .00
COPPER    T=      7.48  SIGNIFICANT    EMEAN-CMEAN=     6.97 DEG=  4 EMEAN=    20.20 EDEV=     1.25 CMEAN=     13.23 CDEV=     1.02
NICKLE    T=      3.64  SIGNIFICANT    EMEAN-CMEAN=     -.77 DEG=  4 EMEAN=     5.90 EDEV=      .20 CMEAN=      6.67 CDEV=      .31
LEAD      T=       .25 NOT SIGNIFICANT EMEAN-CMEAN=      .10 DEG=  4 EMEAN=     5.23 EDEV=      .40 CMEAN=      5.13 CDEV=      .58
ZINC      T=       .44 NOT SIGNIFICANT EMEAN-CMEAN=    -3.00 DEG=  4 EMEAN=    90.00 EDEV=     9.36 CMEAN=     93.00 CDEV=     7.01
              DAY NUMBER   50
CADMIUM   T=      4.24  SIGNIFICANT    EMEAN-CMEAN=     -.20 DEG=  4 EMEAN=     1.57 EDEV=      .06 CMEAN=      1.77 CDEV=      .06
CHROMIUM  T=      1.32 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  4 EMEAN=     4.17 EDEV=      .06 CMEAN=      3.90 CDEV=      .35
COPPER    T=      7.52  SIGNIFICANT    EMEAN-CMEAN=     6.77 DEG=  4 EMEAN=    20.03 EDEV=      .75 CMEAN=     13.27 CDEV=     1.37
NICKLE    T=      1.73 NOT SIGNIFICANT EMEAN-CMEAN=      .10 DEG=  4 EMEAN=     3.90 EDEV=      .10 CMEAN=      3.80 CDEV=      .00
LEAD      T=      1.91 NOT SIGNIFICANT EMEAN-CMEAN=     1.77 DEG=  4 EMEAN=     5.23 EDEV=     1.50 CMEAN=      3.47 CDEV=      .58
ZINC      T=      5.41  SIGNIFICANT    EMEAN-CMEAN=    39.23 DEG=  4 EMEAN=   100.67 EDEV=    11.63 CMEAN=     61.43 CDEV=     4.75
              DAY NUMBER   85
CADMIUM   T=      5.50  SIGNIFICANT    EMEAN-CMEAN=      .37 DEG=  4 EMEAN=     1.40 EDEV=      .10 CMEAN=      1.03 CDEV=      .06
CHROMIUM  T=      2.18 NOT SIGNIFICANT EMEAN-CMEAN=     1.03 DEG=  4 EMEAN=     7.13 EDEV=      .55 CMEAN=      6.10 CDEV=      .61
COPPER    T=       .83 NOT SIGNIFICANT EMEAN-CMEAN=    -1.60 DEG=  4 EMEAN=    22.20 EDEV=     1.11 CMEAN=     23.80 CDEV=     3.14
NICKLE    T=      3.62  SIGNIFICANT    EMEAN-CMEAN=      .57 DEG=  4 EMEAN=     6.37 EDEV=      .21 CMEAN=      5.80 CDEV=      .17
LEAD      T=       .08 NOT SIGNIFICANT EMEAN-CMEAN=      .03 DEG=  4 EMEAN=     5.37 EDEV=      .55 CMEAN=      5.33 CDEV=      .45
ZINC      T=       .67 NOT SIGNIFICANT EMEAN-CMEAN=     2.93 DEG=  4 EMEAN=   106.20 EDEV=     4.23 CMEAN=    103.27 CDEV=     6.30
              DAY NUMBER  125
CADMIUM   T=     11.02  SIGNIFICANT    EMEAN-CMEAN=      .90 DEG=  4 EMEAN=     2.40 EDEV=      .10 CMEAN=      1.50 CDEV=      .10
CHROMIUM  T=      1.25 NOT SIGNIFICANT EMEAN-CMEAN=     1.30 DEG=  4 EMEAN=     4.00 EDEV=      .52 CMEAN=      2.70 CDEV=     1.73
COPPER    T=     15.28  SIGNIFICANT    EMEAN-CMEAN=    15.70 DEG=  4 EMEAN=    27.43 EDEV=     1.46 CMEAN=     11.73 CDEV=     1.01
NICKLE    T=       .59 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  4 EMEAN=     5.87 EDEV=      .59 CMEAN=      5.60 CDEV=      .52
LEAD      T=      1.85 NOT SIGNIFICANT EMEAN-CMEAN=      .77 DEG=  4 EMEAN=     4.10 EDEV=      .10 CMEAN=      3.33 CDEV=      .71
ZINC      T=      7.15  SIGNIFICANT    EMEAN-CMEAN=   -41.40 DEG=  4 EMEAN=    90.77 EDEV=     6.12 CMEAN=    132.17 CDEV=     7.95
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     CLAM          SHELL          EXPERIMENT NO=2                                                          23
               DAY NUMBER    0
CADMIUM   NO EXPERMENT MEAN=      3.87 DEVIATION=      .55 NUM= 3
CHROMIUM  NO EXPERMENT MEAN=      7.17 DEVIATION=     1.27 NUM= 3
COPPER    NO EXPERMENT MEAN=      4.45 DEVIATION=      .00 NUM= 3
NICKLE    NO EXPERMENT MEAN=     13.03 DEVIATION=     1.55 NUM= 3
LEAD      NO EXPERMENT MEAN=     33.97 DEVIATION=     1.46 NUM= 3
ZINC      NO EXPERMENT MEAN=      1.90 DEVIATION=      .87 NUM= 3
               DAY NUMBER    1
CADMIUM   T=        .66 NOT SIGNIFICANT EMEAN-CMEAN=      .13 DEG=  4 EMEAN=     2.40 EDEV=       .20 CMEAN=      2.27 CDEV=       .29
CHROMIUM  T=        .53 NOT SIGNIFICANT EMEAN-CMEAN=     -.27 DEG=  4 EMEAN=     6.97 EDEV=       .74 CMEAN=      7.23 CDEV=       .47
COPPER    T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=    -1.48 DEG=  4 EMEAN=     4.45 EDEV=       .00 CMEAN=      5.93 CDEV=      2.57
NICKLE    T=        .22 NOT SIGNIFICANT EMEAN-CMEAN=     -.23 DEG=  4 EMEAN=    15.13 EDEV=       .81 CMEAN=     15.37 CDEV=      1.66
LEAD      T=        .54 NOT SIGNIFICANT EMEAN-CMEAN=    -2.33 DEG=  4 EMEAN=    36.93 EDEV=      1.76 CMEAN=     39.27 CDEV=      7.30
ZINC      T=       1.54 NOT SIGNIFICANT EMEAN-CMEAN=    -1.37 DEG=  4 EMEAN=     2.13 EDEV=      1.27 CMEAN=      3.50 CDEV=       .87
               DAY NUMBER    5
CADMIUM   T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=     -.13 DEG=  4 EMEAN=     2.67 EDEV=       .21 CMEAN=      2.80 CDEV=       .10
CHROMIUM  T=        .78 NOT SIGNIFICANT EMEAN-CMEAN=     -.27 DEG=  4 EMEAN=     6.97 EDEV=       .57 CMEAN=      7.23 CDEV=       .15
COPPER    T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=     1.52 DEG=  4 EMEAN=     5.97 EDEV=      2.63 CMEAN=      4.45 CDEV=       .00
NICKLE    T=        .90 NOT SIGNIFICANT EMEAN-CMEAN=     -.77 DEG=  4 EMEAN=    12.17 EDEV=       .71 CMEAN=     12.93 CDEV=      1.29
LEAD      T=        .57 NOT SIGNIFICANT EMEAN-CMEAN=     -.67 DEG=  4 EMEAN=    35.13 EDEV=       .60 CMEAN=     35.80 CDEV=      1.87
ZINC                      EMEAN=CMEAN                                 EMEAN=     1.40  EDEV=     .60  CMEAN=      1.40CDEV=     .00
               DAY NUMBER   25
CADMIUM   T=        .80 NOT SIGNIFICANT EMEAN-CMEAN=      .10 DEG=  4 EMEAN=     2.97 EDEV=       .21 CMEAN=      2.87 CDEV=       .06
CHROMIUM  T=        .40 NOT SIGNIFICANT EMEAN-CMEAN=      .17 DEG=  4 EMEAN=     8.00 EDEV=       .26 CMEAN=      7.83 CDEV=       .68
COPPER                    EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=     .26  CMEAN=      4.45CDEV=     .00
NICKLE    T=        .48 NOT SIGNIFICANT EMEAN-CMEAN=      .23 DEG=  4 EMEAN=    13.67 EDEV=       .81 CMEAN=     13.43 CDEV=       .23
LEAD      T=        .82 NOT SIGNIFICANT EMEAN-CMEAN=     1.33 DEG=  4 EMEAN=    34.77 EDEV=       .51 CMEAN=     33.43 CDEV=      2.77
ZINC      T=       2.63 NOT SIGNIFICANT EMEAN-CMEAN=     3.07 DEG=  4 EMEAN=     4.93 EDEV=      1.85 CMEAN=      1.87 CDEV=       .81
               DAY NUMBER   50
CADMIUM   T=        .72 NOT SIGNIFICANT EMEAN-CMEAN=     -.13 DEG=  4 EMEAN=     2.07 EDEV=       .31 CMEAN=      2.20 CDEV=       .10
CHROMIUM  T=        .06 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     7.27 EDEV=       .81 CMEAN=      7.30 CDEV=       .50
COPPER                    EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=     .31  CMEAN=      4.45CDEV=     .00
NICKLE    T=        .14 NOT SIGNIFICANT EMEAN-CMEAN=      .07 DEG=  4 EMEAN=     8.13 EDEV=       .80 CMEAN=      8.07 CDEV=       .06
LEAD      T=       2.53 NOT SIGNIFICANT EMEAN-CMEAN=    -2.43 DEG=  4 EMEAN=    45.97 EDEV=      1.27 CMEAN=     48.40 CDEV=      1.09
ZINC      T=       1.28 NOT SIGNIFICANT EMEAN-CMEAN=      .93 DEG=  4 EMEAN=     3.63 EDEV=       .45 CMEAN=      2.70 CDEV=      1.18
               DAY NUMBER   85
CADMIUM   T=        .45 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     2.03 EDEV=       .06 CMEAN=      2.07 CDEV=       .12
CHROMIUM  T=        .54 NOT SIGNIFICANT EMEAN-CMEAN=      .40 DEG=  4 EMEAN=     9.27 EDEV=       .46 CMEAN=      8.87 CDEV=      1.20
COPPER                    EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=     .46  CMEAN=      4.45CDEV=     .00
NICKLE    T=        .27 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  4 EMEAN=    14.77 EDEV=       .38 CMEAN=     14.57 CDEV=      1.24
LEAD      T=        .25 NOT SIGNIFICANT EMEAN-CMEAN=     -.43 DEG=  4 EMEAN=    48.13 EDEV=      2.76 CMEAN=     48.57 CDEV=      1.27
ZINC      T=       1.97 NOT SIGNIFICANT EMEAN-CMEAN=     1.03 DEG=  4 EMEAN=     2.43 EDEV=       .91 CMEAN=      1.40 CDEV=       .00
               DAY NUMBER  125
CADMIUM   T=        .32 NOT SIGNIFICANT EMEAN-CMEAN=      .03 DEG=  4 EMEAN=     2.73 EDEV=       .06 CMEAN=      2.70 CDEV=       .17
CHROMIUM  T=        .57 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  4 EMEAN=     6.50 EDEV=       .00 CMEAN=      6.30 CDEV=       .61
COPPER                    EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=     .00  CMEAN=      4.45CDEV=     .00
NICKLE    T=       1.02 NOT SIGNIFICANT EMEAN-CMEAN=      .90 DEG=  4 EMEAN=    18.00 EDEV=       .40 CMEAN=     17.10 CDEV=      1.47
LEAD      T=       1.16 NOT SIGNIFICANT EMEAN-CMEAN=    -1.13 DEG=  4 EMEAN=    43.90 EDEV=      1.56 CMEAN=     45.03 CDEV=       .65
ZINC      T=        .49 NOT SIGNIFICANT EMEAN-CMEAN=     -.70 DEG=  4 EMEAN=     2.90 EDEV=      1.50 CMEAN=      3.60 CDEV=      2.00
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     HOLOTHUR      BODY          EXPERIMENT NO=2
          DAY NUMBER    0                                                                              24
CADMIUM   NO EXPERMENT MEAN=      1.97 DEVIATION=     .15 NUM= 3
CHRGMIUM  NU EXPERMENT MEAN=      1.70 DEVIATION=     .00 NUM= 3
COPPER    NO EXPERMENT MEAN=      4.45 DEVIATION=     .00 NUM= 3
NICKLE    NU EXPERMENT MEAN=      6.80 DEVIATION=     .35 NUM= 3
LEAD      NO EXPERMENT MEAN=     11.23 DEVIATION=    1.31 NUM= 3
ZINC      NU EXPERMENT MEAN=      5.27 DEVIATION=     .23 NUM= 3
          DAY NUMBER    1
CADMIUM   T=        1.51 NOT SIGNIFICANT EMEAN-CMEAN=     .17 DEG=  4 EMEAN=    1.63 EDEV=     .15 CMEAN=    1.47 CDEV=     .12
CHROMIUM                  EMEAN=CMEAN                                 EMEAN=    1.70  EDEV.   .15  CMEAN=    1.70CDEV=   .00
COPPER                    EMEAN=CMEAN                                 EMEAN=    4.45  EDEV.   .15  CMEAN=    4.45CDEV=   .00
NICKLE    T=        1.84 NOT SIGNIFICANT EMEAN-CMEAN=     .47 DEG=  4 EMEAN=    6.17 EDEV=     .35 CMEAN=    5.70 CDEV=     .26
LEAD      T=        5.41  SIGNIFICANT    EMEAN-CMEAN=    2.83 DEG=  4 EMEAN=   11.43 EDEV=     .25 CMEAN=    8.60 CDEV=     .87
ZINC      T=        2.80  SIGNIFICANT    EMEAN-CMEAN=     .47 DEG=  4 EMEAN=    4.80 EDEV=     .17 CMEAN=    4.33 CDEV=     .23
          DAY NUMBER    5
CADMIUM   T=        3.02  SIGNIFICANT    EMEAN-CMEAN=    -.27 DEG=  4 EMEAN=    1.20 EDEV=     .00 CMEAN=    1.47 CDEV=     .15
CHROMIUM  T=        2.20 NOT SIGNIFICANT EMEAN-CMEAN=   -1.60 DEG=  4 EMEAN=    3.13 EDEV=    1.24 CMEAN=    4.73 CDEV=     .21
COPPER                    EMEAN=CMEAN                                 EMEAN=    4.45  EDEV=  1.24  CMEAN=    4.45CDEV=   .00
NICKLE    T=        5.79  SIGNIFICANT    EMEAN-CMEAN=   -1.27 DEG=  4 EMEAN=    6.00 EDEV=     .20 CMEAN=    7.27 CDEV=     .32
LEAD      T=         .39 NOT SIGNIFICANT EMEAN-CMEAN=    -.43 DEG=  4 EMEAN=   11.23 EDEV=     .47 CMEAN=   11.67 CDEV=    1.86
ZINC      T=         .70 NOT SIGNIFICANT EMEAN-CMEAN=     .23 DEG=  4 EMEAN=    4.33 EDEV=     .15 CMEAN=    4.10 CDEV=     .56
          DAY NUMBER   25
CADMIUM   T=         .98 NOT SIGNIFICANT EMEAN-CMEAN=     .17 DEG=  4 EMEAN=     .63 EDEV=     .21 CMEAN=     .47 CDEV=     .21
CHROMIUM  T=        1.03 NOT SIGNIFICANT EMEAN-CMEAN=   -3.63 DEG=  4 EMEAN=    5.10 EDEV=     .60 CMEAN=    8.73 CDEV=    6.11
COPPER    T=        1.00 NOT SIGNIFICANT EMEAN-CMEAN=    1.75 DEG=  4 EMEAN=    6.20 EDEV=    3.03 CMEAN=    4.45 CDEV=     .00
NICKLE    T=         .95 NOT SIGNIFICANT EMEAN-CMEAN=   -1.40 DEG=  4 EMEAN=    3.67 EDEV=    2.06 CMEAN=    5.07 CDEV=    1.50
LEAD      T=        1.50 NOT SIGNIFICANT EMEAN-CMEAN=   17.07 DEG=  4 EMEAN=   21.47 EDEV=   10.31 CMEAN=    4.40 CDEV=    7.19
ZINC      T=        1.11 NOT SIGNIFICANT EMEAN-CMEAN=    1.30 DEG=  4 EMEAN=    9.10 EDEV=     .82 CMEAN=    7.80 CDEV=    1.85
          DAY NUMBER   50
CADMIUM   T=         .37 NOT SIGNIFICANT EMEAN-CMEAN=     .05 DEG=  3 EMEAN=     .95 EDEV=     .21 CMEAN=     .90 CDEV=     .10
CHROMIUM  T         3.54  SIGNIFICANT    EMEAN-CMEAN=     .82 DEG=  3 EMEAN=    4.65 EDEV=     .07 CMEAN=    3.83 CDEV=     .31
COPPER    T=         .00 NOT SIGNIFICANT EMEAN-CMEAN=     .00 DEG=  3 EMEAN=    4.45 EDEV=     .00 CMEAN=    4.45 CDEV=     .00
NICKLE    T=         .70 NOT SIGNIFICANT EMEAN-CMEAN=    -.32 DEG=  3 EMEAN=    5.65 EDEV=     .35 CMEAN=    5.97 CDEV=     .55
LEAD      T=        1.81 NOT SIGNIFICANT EMEAN-CMEAN=   -7.95 DEG=  3 EMEAN=    9.95 EDEV=    2.47 CMEAN=   17.90 CDEV=    5.62
ZINC      T=        1.36 NOT SIGNIFICANT EMEAN-CMEAN=    1.55 DEG=  3 EMEAN=    8.05 EDEV=    1.91 CMEAN=    6.50 CDEV=     .72
          DAY NUMBER   85
CADMIUM   T=        1.00 NOT SIGNIFICANT EMEAN-CMEAN=     .03 DEG=  4 EMEAN=     .73 EDEV=     .06 CMEAN=     .70 CDEV=     .00
CHROMIUM  T=         .71 NOT SIGNIFICANT EMEAN-CMEAN=    -.27 DEG=  4 EMEAN=    5.37 EDEV=     .57 CMEAN=    5.63 CDEV=     .32
COPPER                    EMEAN=CMEAN                                 EMEAN=    4.45  EDEV=   .57  CMEAN=    4.45CDEV=   .00
NICKLE    T=        4.91  SIGNIFICANT    EMEAN-CMEAN=    -.43 DEG=  4 EMEAN=    6.17 EDEV=     .15 CMEAN=    6.60 CDEV=     .00
LEAD      T=         .29 NOT SIGNIFICANT EMEAN-CMEAN=     .10 DEG=  4 EMEAN=   13.57 EDEV=     .15 CMEAN=   13.47 CDEV=     .59
ZINC      T=         .07 NOT SIGNIFICANT EMEAN-CMEAN=     .03 DEG=  4 EMEAN=    6.70 EDEV=     .70 CMEAN=    6.67 CDEV=     .51
          DAY NUMBER  125
CADMIUM   T= 26214.40  SIGNIFICANT    EMEAN-CMEAN=     .20 DEG=  4 EMEAN=     .80 EDEV=     .00 CMEAN=     .60 CDEV=     .00
CHROMIUM  T=       14.41  SIGNIFICANT    EMEAN-CMEAN=    7.27 DEG=  4 EMEAN=    8.97 EDEV=     .87 CMEAN=    1.70 CDEV=     .00
COPPER                    EMEAN=CMEAN                                 EMEAN=    4.45  EDEV=   .87  CMEAN=    4.45CDEV=   .00
NICKLE    T=       14.40  SIGNIFICANT    EMEAN-CMEAN=    5.20 DEG=  4 EMEAN=   11.27 EDEV=     .29 CMEAN=    6.07 CDEV=     .55
LEAD      T=        1.98 NOT SIGNIFICANT EMEAN-CMEAN=    1.83 DEG=  4 EMEAN=    7.20 EDEV=     .00 CMEAN=    5.37 CDEV=    1.61
ZINC      T=        9.00  SIGNIFICANT    EMEAN-CMEAN=    9.43 DEG=  4 EMEAN=   19.33 EDEV=    2.80 CMEAN=    9.90 CDEV=    4.68
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     HOLOTHUR      INTERNAL      EXPERIMENT NO=2                                                                             25
              DAY NUMBER    0
  CADMIUM   NO EXPERMENT MEAN=     3.13 DEVIATION=      .15 NUM= 3
  CHROMIUM  NO EXPERMENT MEAN=    14.33 DEVIATION=      .70 NUM= 3
  COPPER    NO EXPERMENT MEAN=     4.45 DEVIATION-      .00 NUM= 3
  NICKLE    NO EXPERMENT MEAN=    19.97 DEVIATION=      .55 NUM= 3
  LEAD      NO EXPERMENT MEAN=    26.77 DEVIATION=     3.50 NUM= 3
  ZINC      NO EXPERMENT MEAN=    26.97 DEVIATION=      .93 NUM= 3
              DAY NUMBER    1
  CADMIUM  T=      3.46  SIGNIFICANT     EMEAN-CMEAN=     -.20 DEG=  4 EMEAN=    1.50 EDEV=      .00 CMEAN=    1.70 CDEV=     .10
  CHROMIUM T=     20.88  SIGNIFICANT     EMEAN-CMEAN=   -13.80 DEG=  4 EMEAN=    7.20 EDEV=      .20 CMEAN=   21.00 CDEV=    1.13
  COPPER   T=      2.00 NOT SIGNIFICANT EMEAN-CMEAN=    -3.10 DEG=  4 EMEAN=    4.45 EDEV=      .00 CMEAN=    7.55 CDEV=    2.69
  NICKLE   T=     36.55  SIGNIFICANT     EMEAN-CMEAN=    19.30 DEG=  4 EMEAN=   25.77 EDEV=      .86 CMEAN=    6.47 CDEV=     .31
  LEAD     T=       .28 NOT SIGNIFICANT EMEAN-CMEAN=     -.07 DEG=  4 EMEAN=    9.33 EDEV=      .38 CMEAN=    9.40 CDEV=     .17
  ZINC     T=      4.64  SIGNIFICANT     EMEAN-CMEAN=    -7.47 DEG=  4 EMEAN=   39.50 EDEV=      .35 CMEAN=   46.97 CDEV=    2.76
              DAY NUMBER    5
  CADMIUM  T=       .49 NOT SIGNIFICANT EMEAN-CMEAN=      .07 DEG=  4 EMEAN=    1.53 EDEV=      .12 CMEAN=    1.47 CDEV=     .21
  CHROMIUM T=      5.43  SIGNIFICANT     EMEAN-CMEAN=    -7.80 DEG=  4 EMEAN=   38.37 EDEV=     2.43 CMEAN=   46.17 CDEV=     .51
  COPPER   T=      7.61  SIGNIFICANT     EMEAN-CMEAN=    -2.60 DEG=  4 EMEAN=   14.00 EDEV=      .53 CMEAN=   16.60 CDEV=     .26
  NICKLE   T=     16.07  SIGNIFICANT     EMEAN-CMEAN=    37.87 DEG=  4 EMEAN=   75.33 EDEV=     3.44 CMEAN= [illegible].47 CDEV=    2.19
  LEAD     T=      1.76 NOT SIGNIFICANT EMEAN-CMEAN=     2.13 DEG=  4 EMEAN=   15.93 EDEV=     1.14 CMEAN=   13.[illegible] CDEV=    1.76
  ZINC     T=      2.56 NOT SIGNIFICANT EMEAN-CMEAN=    10.63 DEG=  4 EMEAN=   57.87 EDEV=     7.02 CME[illegible]   47.23 CDEV=    1.56
              DAY NUMBER   25
  CADMIUM  T=      1.55 NOT SIGNIFICANT EMEAN-CMEAN=     -.07 DEG=  3 EMEAN=     .90 EDEV=      .00 CMEA[illegible]     .97 CDEV=     .06
  CHROMIUM T=      9.35  SIGNIFICANT     EMEAN-CMEAN=    10.87 DEG=  3 EMEAN=   45.00 EDEV=      .42 CMEAN=   34.13 CDEV=    1.53
  COPPER   T=     14.97  SIGNIFICANT     EMEAN-CMEAN=     4.60 DEG=  3 EMEAN=   14.70 EDEV=      .28 CMEAN=   10.10 CDEV=     .36
  NICKLE   T=       .92 NOT SIGNIFICANT EMEAN-CMEAN=     1.68 DEG=  3 EMEAN=   33.05 EDEV=     1.06 CMEAN=   31.37 CDEV=    2.34
  LEAD     T=      2.48 NOT SIGNIFICANT EMEAN-CMEAN=    14.92 DEG=  3 EMEAN=   24.40 EDEV=     1.13 CMEAN=    9.48 CDEV=    8.02
  ZINC     T=      3.54  SIGNIFICANT     EMEAN-CMEAN=     5.48 DEG=  3 EMEAN=   47.35 EDEV=      .21 CMEAN=   41.87 CDEV=    2.07
              DAY NUMBER   50
  CADMIUM  T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=      .07 DEG=  4 EMEAN=     .90 EDEV=      .10 CMEAN=     .83 CDEV=     .06
  CHROMIUM T=     17.59  SIGNIFICANT     EMEAN-CMEAN=    41.23 DEG=  4 EMEAN=   85.50 EDEV=     3.72 CMEAN=   44.27 CDEV=    1.62
  COPPER   T=      3.92  SIGNIFICANT     EMEAN-CMEAN=     5.37 DEG=  4 EMEAN=   20.27 EDEV=     2.28 CMEAN=   14.90 CDEV=     .66
  NICKLE   T=      8.78  SIGNIFICANT     EMEAN-CMEAN=    41.83 DEG=  4 EMEAN=   69.33 EDEV=     8.21 CMEAN=   27.50 CDEV=     .87
  LEAD     T=      3.59  SIGNIFICANT     EMEAN-CMEAN=     3.37 DEG=  4 EMEAN=   10.97 EDEV=     1.25 CMEAN=    7.60 CDEV=    1.04
  ZINC     T=      5.47  SIGNIFICANT     EMEAN-CMEAN=     9.70 DEG=  4 EMEAN=   38.47 EDEV=     2.92 CMEAN=   28.77 CDEV=     .96
              DAY NUMBER   85
  CADMIUM  T=      8.66  SIGNIFICANT     EMEAN-CMEAN=      .50 DEG=  4 EMEAN=    1.40 EDEV=      .00 CMEAN=     .90 CDEV=     .10
  CHROMIUM T=      7.56  SIGNIFICANT     EMEAN-CMEAN=    14.60 DEG=  4 EMEAN=   92.30 EDEV=     2.86 CMEAN=   77.70 CDEV=    1.73
  COPPER   T=     34.66  SIGNIFICANT     EMEAN-CMEAN=    10.33 DEG=  4 EMEAN=   23.77 EDEV=      .15 CMEAN=   13.43 CDEV=     .49
  NICKLE   T=      5.80  SIGNIFICANT     EMEAN-CMEAN=     4.50 DEG=  4 EMEAN=   40.23 EDEV=      .45 CMEAN=   35.73 CDEV=    1.27
  LEAD     T=     29.62  SIGNIFICANT     EMEAN-CMEAN=    31.73 DEG=  4 EMEAN=   48.20 EDEV=     1.75 CMEAN=   16.47 CDEV=     .61
  ZINC     T=      9.66  SIGNIFICANT     EMEAN-CMEAN=    22.90 DEG=  4 EMEAN=   64.67 EDEV=     2.79 CMEAN=   41.77 CDEV=    3.01
              DAY NUMBER  125
  CADMIUM  T=      4.00  SIGNIFICANT     EMEAN-CMEAN=     -.27 DEG=  4 EMEAN=     .80 EDEV=      .00 CMEAN=    1.07 CDEV=     .12
  CHROMIUM T=      9.41  SIGNIFICANT     EMEAN-CMEAN=    20.83 DEG=  4 EMEAN=   51.17 EDEV=     1.51 CMEAN=   30.33 CDEV=    3.52
  COPPER   T=      5.36  SIGNIFICANT     EMEAN-CMEAN=     3.13 DEG=  4 EMEAN=   13.00 EDEV=      .53 CMEAN=    9.87 CDEV=     .86
  NICKLE   T=     22.32  SIGNIFICANT     EMEAN-CMEAN=    15.50 DEG=  4 EMEAN=   35.63 EDEV=      .76 CMEAN=   20.13 CDEV=     .93
  LEAD     T=     10.79  SIGNIFICANT     EMEAN-CMEAN=     7.10 DEG=  4 EMEAN=   14.20 EDEV=     1.13 CMEAN=    7.10 CDEV=     .17
  ZINC     T=      8.42  SIGNIFICANT     EMEAN-CMEAN=    10.50 DEG=  4 EMEAN=   50.40 EDEV=      .96 CMEAN=   39.90 CDEV=    1.93
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     MANGROVE      BODY          EXPERIMENT NO=2                                                      26
              DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=       .25 DEVIATION=       .09 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=      6.87 DEVIATION=       .06 NUM= 3
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=       .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=      9.70 DEVIATION=       .56 NUM= 3
LEAD       NO EXPERMENT MEAN=       .87 DEVIATION=      1.07 NUM= 3
ZINC       NO EXPERMENT MEAN=      2.37 DEVIATION=       .84 NUM= 3
              DAY NUMBER    5
CADMIUM  T=      2.54 NOT SIGNIFICANT EMEAN-CMEAN=      -.83 DEG=  4 EMEAN=      .40 EDEV=      .00 CMEAN=     1.23 CDEV=      .57
CHROMIUM T=       .53 NOT SIGNIFICANT EMEAN-CMEAN=      1.60 DEG=  4 EMEAN=     6.27 EDEV=      .75 CMEAN=     4.67 CDEV=     5.14
COPPER                   EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .75  CMEAN=     4.45CDEV=     .00
NICKLE   T=      3.87  SIGNIFICANT    EMEAN-CMEAN=      2.73 DEG=  4 EMEAN=     9.13 EDEV=      .68 CMEAN=     6.40 CDEV=     1.01
LEAD     T=      1.14 NOT SIGNIFICANT EMEAN-CMEAN=     -3.67 DEG=  4 EMEAN=     2.52 EDEV=     2.10 CMEAN=     6.18 CDEV=     5.18
ZINC     T=      1.82 NOT SIGNIFICANT EMEAN-CMEAN=     -1.53 DEG=  4 EMEAN=     4.07 EDEV=      .23 CMEAN=     5.60 CDEV=     1.44
              DAY NUMBER   50
CADMIUM                  EMEAN=CMEAN                                 EMEAN=      .15  EDEV=    .23  CMEAN=      .15CDEV=     .00
CHROMIUM T=      3.78  SIGNIFICANT    EMEAN-CMEAN=       .33 DEG=  4 EMEAN=     4.83 EDEV=      .15 CMEAN=     4.50 CDEV=      .00
COPPER                   EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .15  CMEAN=     4.45CDEV=     .00
NICKLE   T=      1.12 NOT SIGNIFICANT EMEAN-CMEAN=      -.17 DEG=  4 EMEAN=     3.47 EDEV=      .15 CMEAN=     3.63 CDEV=      .21
LEAD                     EMEAN=CMEAN                                 EMEAN=      .25  EDEV=    .15  CMEAN=      .25CDEV=     .00
ZINC     T=       .24 NOT SIGNIFICANT EMEAN-CMEAN=       .30 DEG=  4 EMEAN=     3.27 EDEV=     1.62 CMEAN=     2.97 CDEV=     1.46
              DAY NUMBER  125
CADMIUM  T=      1.39 NOT SIGNIFICANT EMEAN-CMEAN=      -.08 DEG=  4 EMEAN=      .25 EDEV=      .09 CMEAN=      .33 CDEV=      .06
CHROMIUM T=      2.98  SIGNIFICANT    EMEAN-CMEAN=       .47 DEG=  4 EMEAN=     7.07 EDEV=      .25 CMEAN=     6.60 CDEV=      .10
COPPER                   EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .25  CMEAN=     4.45CDEV=     .00
NICKLE   T=      3.06  SIGNIFICANT    EMEAN-CMEAN=     -1.27 DEG=  4 EMEAN=     4.13 EDEV=      .29 CMEAN=     5.40 CDEV=      .66
LEAD                     EMEAN=CMEAN                                 EMEAN=      .25  EDEV=    .29  CMEAN=      .25CDEV=     .00
ZINC     T=      2.39 NOT SIGNIFICANT EMEAN-CMEAN=     -1.17 DEG=  4 EMEAN=     3.63 EDEV=      .80 CMEAN=     4.80 CDEV=      .26
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                                                                                                  27
     MANGROVE      STEM          EXPERIMENT NO=2
           DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=       .40 DEVIATION=      .10 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=      1.70 DEVIATION=      .00 NUM= 3
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=      .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=      4.67 DEVIATION=      .32 NUM= 3
LEAD       NO EXPERMENT MEAN=      3.72 DEVIATION=     3.04 NUM= 3
ZINC       NO EXPERMENT MEAN=      4.87 DEVIATION=      .15 NUM= 3
           DAY NUMBER    5
CADMIUM   T=      1.80 NOT SIGNIFICANT EMEAN-CMEAN=     -.15 DEG=  3 EMEAN=     .55 EDEV=     .07 CMEAN=     .70 CDEV=     .10
CHROMIUM  T=      1.80 NOT SIGNIFICANT EMEAN-CMEAN=    -1.88 DEG=  3 EMEAN=    7.85 EDEV=    1.48 CMEAN=    9.73 CDEV=     .93
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      .00 DEG=  3 EMEAN=    4.45 EDEV=     .00 CMEAN=    4.45 CDEV=     .00
NICKLE    T=      5.28  SIGNIFICANT    EMEAN-CMEAN=     6.85 DEG=  3 EMEAN=   12.95 EDEV=    2.33 CMEAN=    6.10 CDEV=     .56
LEAD      T=     13.83  SIGNIFICANT    EMEAN-CMEAN=     6.70 DEG=  3 EMEAN=    6.95 EDEV=     .92 CMEAN=     .25 CDEV=     .00
ZINC      T=      2.55 NOT SIGNIFICANT EMEAN-CMEAN=    -6.20 DEG=  3 EMEAN=    8.30 EDEV=     .85 CMEAN=   14.50 CDEV=    3.21
           DAY NUMBER   50
CADMIUM                 EMEAN=CMEAN                              EMEAN=     .15  EDEV=    .85  CMEAN=     .15CDEV=    .00
CHROMIUM                EMEAN=CMEAN                              EMEAN=    1.70  EDEV=    .85  CMEAN=    1.70CDEV=    .00
COPPER                  EMEAN=CMEAN                              EMEAN=    4.45  EDEV=    .85  CMEAN=    4.45CDEV=    .00
NICKLE    T=       .73 NOT SIGNIFICANT EMEAN-CMEAN=     -.27 DEG=  4 EMEAN=    2.60 EDEV=     .53 CMEAN=    2.87 CDEV=     .35
LEAD                    EMEAN=CMEAN                              EMEAN=     .25  EDEV=    .53  CMEAN=     .25CDEV=    .00
ZINC      T=      1.86 NOT SIGNIFICANT EMEAN-CMEAN=     -.90 DEG=  4 EMEAN=    4.30 EDEV=     .70 CMEAN=    5.20 CDEV=     .46
           DAY NUMBER 125
CADMIUM   T=       .48 NOT SIGNIFICANT EMEAN-CMEAN=      .05 DEG=  4 EMEAN=     .40 EDEV=     .00 CMEAN=     .35 CDEV=     .18
CHROMIUM  T=       .10 NOT SIGNIFICANT EMEAN-CMEAN=      .10 DEG=  4 EMEAN=    3.10 EDEV=    1.23 CMEAN=    3.00 CDEV=    1.14
COPPER    T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     1.55 DEG=  4 EMEAN=    6.00 EDEV=    2.68 CMEAN=    4.45 CDEV=     .00
NICKLE    T=       .23 NOT SIGNIFICANT EMEAN-CMEAN=     -.07 DEG=  4 EMEAN=    4.13 EDEV=     .32 CMEAN=    4.20 CDEV=     .40
LEAD      T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     2.98 DEG=  4 EMEAN=    3.23 EDEV=    5.17 CMEAN=     .25 CDEV=     .00
ZINC      T=      1.63 NOT SIGNIFICANT EMEAN-CMEAN=    -1.43 DEG=  4 EMEAN=    7.77 EDEV=     .65 CMEAN=    9.20 CDEV=    1.37
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      MANGROVE      LEAF          EXPERIMENT NO=2                                                          28
            DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=        .37 DEVIATION=       .06 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=       1.70 DEVIATION=       .00 NUM= 3
COPPER     NO EXPERMENT MEAN=       4.45 DEVIATION=       .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=       5.87 DEVIATION=       .06 NUM= 3
LEAD       NO EXPERMENT MEAN=       2.85 DEVIATION=      2.37 NUM= 3
ZINC       NO EXPERMENT MEAN=      15.80 DEVIATION=      1.64 NUM= 3
            DAY NUMBER    5
CADMIUM   T=      .36 NOT SIGNIFICANT EMEAN-CMEAN=    -.07 DEG=  3 EMEAN=      .73 EDEV=     .15 CMEAN=      .80 CDEV=     .28
CHROMIUM  T=     4.82  SIGNIFICANT    EMEAN-CMEAN=   -8.45 DEG=  3 EMEAN=     1.70 EDEV=     .00 CMEAN=    10.15 CDEV=    3.92
COPPER    T=     6.53  SIGNIFICANT    EMEAN-CMEAN=    7.38 DEG=  3 EMEAN=    11.83 EDEV=    1.52 CMEAN=     4.45 CDEV=     .00
NICKLE    T=      .58 NOT SIGNIFICANT EMEAN-CMEAN=    -.65 DEG=  3 EMEAN=     6.60 EDEV=    1.18 CMEAN=     7.25 CDEV=    1.34
LEAD      T=     3.30  SIGNIFICANT    EMEAN-CMEAN=    5.22 DEG=  3 EMEAN=     5.47 EDEV=    2.12 CMEAN=      .25 CDEV=     .00
ZINC      T=     1.95 NOT SIGNIFICANT EMEAN-CMEAN=   -2.10 DEG=  3 EMEAN=    10.10 EDEV=     .80 CMEAN=    12.20 CDEV=    1.70
            DAY NUMBER   50
CADMIUM                   EMEAN=CMEAN                          EMEAN=      .15  EDEV=   .80  CMEAN=      .15CDEV=   .00
CHROMIUM                  EMEAN=CMEAN                          EMEAN=     1.70  EDEV=   .80  CMEAN=     1.70CDEV=   .00
COPPER    T=    20.64  SIGNIFICANT    EMEAN-CMEAN=    4.82 DEG=  4 EMEAN=     9.27 EDEV=     .40 CMEAN=     4.45 CDEV=     .00
NICKLE    T=     1.11 NOT SIGNIFICANT EMEAN-CMEAN=     .20 DEG=  4 EMEAN=     2.67 EDEV=     .06 CMEAN=     2.47 CDEV=     .31
LEAD      T=     1.51 NOT SIGNIFICANT EMEAN-CMEAN=   -2.60 DEG=  4 EMEAN=      .25 EDEV=     .00 CMEAN=     2.85 CDEV=    2.98
ZINC      T=      .83 NOT SIGNIFICANT EMEAN-CMEAN=    1.57 DEG=  4 EMEAN=    11.07 EDEV=    3.05 CMEAN=     9.50 CDEV=    1.22
            DAY NUMBER  125
CADMIUM   T=     2.12 NOT SIGNIFICANT EMEAN-CMEAN=    -.10 DEG=  4 EMEAN=      .37 EDEV=     .06 CMEAN=      .47 CDEV=     .06
CHROMIUM  T=    32.91  SIGNIFICANT    EMEAN-CMEAN=   -1.90 DEG=  4 EMEAN=     1.70 EDEV=     .00 CMEAN=     3.60 CDEV=     .10
COPPER    T=     2.19 NOT SIGNIFICANT EMEAN-CMEAN=   -3.47 DEG=  4 EMEAN=     6.00 EDEV=    2.68 CMEAN=     9.47 CDEV=     .55
NICKLE    T=    15.65  SIGNIFICANT    EMEAN-CMEAN=   -2.33 DEG=  4 EMEAN=     2.43 EDEV=     .06 CMEAN=     4.77 CDEV=     .25
LEAD      T=     1.00 NOT SIGNIFICANT EMEAN-CMEAN=    1.25 DEG=  4 EMEAN=     1.50 EDEV=    2.17 CMEAN=      .25 CDEV=     .00
ZINC      T=     3.37  SIGNIFICANT    EMEAN-CMEAN=   -5.37 DEG=  4 EMEAN=     7.57 EDEV=     .25 CMEAN=    12.93 CDEV=    2.75
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                                                                                                        29
      MANGROVE      ROOT          EXPERIMENT NO=2
              DAY NUMBER    0
CADMIUM   NO EXPERMENT MEAN=       .80 DEVIATION=      .20 NUM= 3
CHROMIUM  NO EXPERMENT MEAN=     24.37 DEVIATION=     3.70 NUM= 3
COPPER    NO EXPERMENT MEAN=     10.37 DEVIATION=      .21 NUM= 3
NICKLE    NO EXPERMENT MEAN=     32.57 DEVIATION=     1.17 NUM= 3
LEAD      NO EXPERMENT MEAN=      4.23 DEVIATION=      .42 NUM= 3
ZINC      NO EXPERMENT MEAN=     22.97 DEVIATION=     2.48 NUM= 3
              DAY NUMBER    5
CADMIUM   T=     10.84  SIGNIFICANT     EMEAN-CMEAN=     -.47 DEG=  3 EMEAN=       .53 EDEV=      .06 CMEAN=     1.00 CDEV=      .00
CHROMIUM  T=      1.53 NOT SIGNIFICANT EMEAN-CMEAN=     1.12 DEG=  3 EMEAN=     17.57 EDEV=      .23 CMEAN=    16.45 CDEV=     1.34
COPPER    T=      1.41 NOT SIGNIFICANT EMEAN-CMEAN=     2.76 DEG=  3 EMEAN=      9.83 EDEV=      .21 CMEAN=     7.07 CDEV=     3.71
NICKLE    T=     18.59  SIGNIFICANT     EMEAN-CMEAN=     9.73 DEG=  3 EMEAN=     26.63 EDEV=      .49 CMEAN=    16.90 CDEV=      .71
LEAD      T=      2.12 NOT SIGNIFICANT EMEAN-CMEAN=     2.99 DEG=  3 EMEAN=      5.07 EDEV=      .50 CMEAN=     2.07 CDEV=     2.58
ZINC      T=     14.76  SIGNIFICANT     EMEAN-CMEAN=     3.85 DEG=  3 EMEAN=     20.90 EDEV=      .35 CMEAN=    17.05 CDEV=      .07
              DAY NUMBER   50
CADMIUM                EMEAN=CMEAN                                 EMEAN=       .33  EDEV=     .36  CMEAN=      .33CDEV=     .06
CHROMIUM  T=     10.13  SIGNIFICANT     EMEAN-CMEAN=     9.13 DEG=  4 EMEAN=     16.87 EDEV=     1.50 CMEAN=     7.73 CDEV=      .42
COPPER    T=     19.63  SIGNIFICANT     EMEAN-CMEAN=     5.82 DEG=  4 EMEAN=     10.27 EDEV=      .51 CMEAN=     4.45 CDEV=      .00
NICKLE    T=     11.23  SIGNIFICANT     EMEAN-CMEAN=     6.00 DEG=  4 EMEAN=     10.47 EDEV=      .87 CMEAN=     4.47 CDEV=      .31
LEAD      T=       .93 NOT SIGNIFICANT EMEAN-CMEAN=    -2.68 DEG=  4 EMEAN=      2.55 EDEV=     2.19 CMEAN=     5.23 CDEV=     4.47
ZINC      T=      5.76  SIGNIFICANT     EMEAN-CMEAN=     3.50 DEG=  4 EMEAN=     15.93 EDEV=      .67 CMEAN=    12.43 CDEV=      .81
              DAY NUMBER  125
CADMIUM   T=       .87 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  4 EMEAN=       .70 EDEV=      .00 CMEAN=      .80 CDEV=      .20
CHROMIUM  T=     80.30  SIGNIFICANT     EMEAN-CMEAN=    23.33 DEG=  4 EMEAN=     30.53 EDEV=      .35 CMEAN=     7.20 CDEV=      .36
COPPER                 EMEAN=CMEAN                                 EMEAN=      4.45  EDEV=     .35  CMEAN=     4.45CDEV=     .00
NICKLE    T=      2.35 NOT SIGNIFICANT EMEAN-CMEAN=     1.33 DEG=  4 EMEAN=     14.10 EDEV=      .20 CMEAN=    12.77 CDEV=      .96
LEAD      T=      4.49  SIGNIFICANT     EMEAN-CMEAN=     5.77 DEG=  4 EMEAN=      7.30 EDEV=      .10 CMEAN=     1.53 CDEV=     2.22
ZINC      T=      1.72 NOT SIGNIFICANT EMEAN-CMEAN=     3.60 DEG=  4 EMEAN=     22.33 EDEV=     3.35 CMEAN=    18.73 CDEV=     1.37
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    NERITA        INTERNAL       EXPERIMENT NO=2                                                                         30
           DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=       3.80 DEVIATION=       .62 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=       6.23 DEVIATION=       .15 NUM= 3
COPPER     NO EXPERMENT MEAN=  ~~  45.57 DEVIATION=~~    6.04 NUM= 3
NICKLE     NO EXPERMENT MEAN=      11.20 DEVIATION=       .80 NUM= 3
LEAD       NO EXPERMENT MEAN=      15.90 DEVIATION=       .36 NUM= 3
ZINC       NO EXPERMENT MEAN=     147.97 DEVIATION=     30.28 NUM= 3
           DAY NUMBER    1
CADMIUM   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.20 DEG=  0 EMEAN=     1.40 EDEV=      .00 CMEAN=     1.60 CDEV=      .00
CHROMIUM                   EMEAN=CMEAN                           EMEAN=     1.70  EDEV=     .00  CMEAN=     1.70CDEV=    .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     1.70 DEG=  0 EMEAN=    11.30 EDEV=      .00 CMEAN=     9.60 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -1.40 DEG=  0 EMEAN=     7.30 EDEV=      .00 CMEAN=     8.70 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -1.40 DEG=  0 EMEAN=     7.90 EDEV=      .00 CMEAN=     9.30 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=   -15.90 DEG=  0 EMEAN=   112.20 EDEV=      .00 CMEAN=   128.10 CDEV=      .00
           DAY NUMBER    5
CADMIUM                    EMEAN=CMEAN                           EMEAN=     1.80  EDEV=     .00  CMEAN=     1.80CDEV=    .00
CHROMIUM                   EMEAN=CKEAN                           EMEAN=     1.70  EDEV=     .00  CMEAN=     1.70CDEV=    .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -8.30 DEG=  0 EMEAN=    53.60 EDEV=      .00 CMEAN=    61.90 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     2.50 DEG=  0 EMEAN=     9.00 EDEV=      .00 CMEAN=     6.50 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -1.80 DEG=  0 EMEAN=     7.00 EDEV=      .00 CMEAN=     8.80 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=   -48.80 DEG=  0 EMEAN=   127.50 EDEV=      .00 CMEAN=   176.30 CDEV=      .00
           DAY NUMBER   25
CADMIUM   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  0 EMEAN=     1.90 EDEV=      .00 CMEAN=     1.70 CDEV=      .00
CHROMIUM                   EMEAN=CMEAN                           EMEAN=     1.70  EDEV=     .00  CMEAN=     1.70CDEV=    .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -5.70 DEG=  0 EMEAN=    43.30 EDEV=      .00 CMEAN=    49.00 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  0 EMEAN=     6.00 EDEV=      .00 CMEAN=     5.80 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     -.50 DEG=  0 EMEAN=     7.70 EDEV=      .00 CMEAN=     8.20 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=   -44.00 DEG=  0 EMEAN=   132.70 EDEV=      .00 CMEAN=   176.70 CDEV=      .00
           DAY NUMBER   50
CADMIUM   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     2.10 DEG=  0 EMEAN=     4.40 EDEV=      .00 CMEAN=     2.30 CDEV=      .00
CHROMIUM  T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -2.20 DEG=  0 EMEAN=     5.20 EDEV=      .00 CMEAN=     7.40 CDEV=      .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     3.00 DEG=  0 EMEAN=    67.80 EDEV=      .00 CMEAN=    64.80 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     1.90 DEG=  0 EMEAN=    15.70 EDEV=      .00 CMEAN=    13.80 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     7.70 DEG=  0 EMEAN=    18.30 EDEV=      .00 CMEAN=    10.60 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    86.40 DEG=  0 EMEAN=   193.80 EDEV=      .00 CMEAN=   107.40 CDEV=      .00
           DAY NUMBER   85
CADMIUM   T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=     1.10 DEG=  0 EMEAN=     2.60 EDEV=      .00 CMEAN=     1.50 CDEV=      .00
CHROMIUM  T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -5.20 DEG=  0 EMEAN=     4.80 EDEV=      .00 CMEAN=    10.00 CDEV=      .00
COPPER    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    26.00 DEG=  0 EMEAN=   100.90 EDEV=      .00 CMEAN=    74.90 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=    -4.10 DEG=  0 EMEAN=     7.80 EDEV=      .00 CMEAN=    11.90 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  0 EMEAN=     8.70 EDEV=      .00 CMEAN=     8.50 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT EMEAN-CMEAN=   -22.20 DEG=  0 EMEAN=   120.60 EDEV=      .00 CMEAN=   142.80 CDEV=      .00
           DAY NUMBER  125
CADMIUM    NO CONTROL    MEAN=      3.80 DEVIATION=       .00 NUM= 1
CHROMIUM   NO CONTROL    MEAN=      6.30 DEVIATION=       .00 NUM= 1
COPPER     NO CONTROL    MEAN=     57.70 DEVIATION=       .00 NUM= 1
NICKLE     NO CONTROL    MEAN=     10.30 DEVIATION=       .00 NUM= 1
LEAD       NO CONTROL    MEAN=     11.60 DEVIATION=       .00 NUM= 1
ZINC       NO CONTROL    MEAN=    123.20 DEVIATION=       .00 NUM= 1
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     NERITA        SHELL          EXPERIMENT NO=2
            DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=      3.77 DEVIATION=       .45 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=      7.87 DEVIATION=       .90 NUM= 3
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=       .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=     12.10 DEVIATION=       .78 NUM= 3
LEAD       NO EXPERMENT MEAN=     36.00 DEVIATION=       .35 NUM= 3
ZINC       NO EXPERMENT MEAN=      4.97 DEVIATION=       .15 NUM= 3
            DAY NUMBER    1
CADMIUM  T=      1.79 NOT SIGNIFICANT EMEAN-CMEAN=     -.47 DEG=  4 EMEAN=     3.00 EDEV=      .00 CMEAN=     3.47 CDEV=     .45
CHROMIUM T=       .71 NOT SIGNIFICANT EMEAN-CMEAN=     -.57 DEG=  4 EMEAN=     7.93 EDEV=      .65 CMEAN=     8.50 CDEV=    1.21
COPPER                 EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .65  CMEAN=     4.45CDEV=    .00
NICKLE    T=     1.75 NOT SIGNIFICANT EMEAN-CMEAN=    -1.27 DEG=  4 EMEAN=    11.73 EDEV=      .29 CMEAN=    13.00 CDEV=    1.22
LEAD      T=      .51 NOT SIGNIFICANT EMEAN-CMEAN=     -.67 DEG=  4 EMEAN=    35.83 EDEV=     1.77 CMEAN=    36.50 CDEV=    1.40
ZINC      T=      .28 NOT SIGNIFICANT EMEAN-CMEAN=      .30 DEG=  4 EMEAN=     5.77 EDEV=     1.59 CMEAN=     5.47 CDEV=    1.61
            DAY NUMBER    5
CADMIUM   T=      .36 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  4 EMEAN=     3.87 EDEV=      .12 CMEAN=     3.97 CDEV=     .46
CHROMIUM T=      1.21 NOT SIGNIFICANT EMEAN-CMEAN=     -.70 DEG=  4 EMEAN=     6.37 EDEV=      .76 CMEAN=     7.07 CDEV=     .64
COPPER                 EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .76  CMEAN=     4.45CDEV=    .00
NICKLE    T=      .53 NOT SIGNIFICANT EMEAN-CMEAN=      .53 DEG=  4 EMEAN=    12.73 EDEV=      .99 CMEAN=    12.20 CDEV=    1.46
LEAD      T=      .65 NOT SIGNIFICANT EMEAN-CMEAN=      .93 DEG=  4 EMEAN=    34.53 EDEV=      .92 CMEAN=    33.60 CDEV=    2.33
ZINC      T=      .06 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     4.43 EDEV=      .59 CMEAN=     4.47 CDEV=     .76
            DAY NUMBER   25
CADMIUM                EMEAN=CMEAN                                 EMEAN=     3.17  EDEV=    .59  CMEAN=     3.17CDEV=    .40
CHROMIUM T=      2.04 NOT SIGNIFICANT EMEAN-CMEAN=     -.90 DEG=  4 EMEAN=     7.63 EDEV=      .25 CMEAN=     8.53 CDEV=     .72
COPPER                 EMEAN=CMEAN                                 EMEAN=     4.45  EDEV=    .25  CMEAN=     4.45CDEV=    .00
NICKLE    T=      .21 NOT SIGNIFICANT EMEAN-CMEAN=     -.13 DEG=  4 EMEAN=    11.33 EDEV=      .58 CMEAN=    11.47 CDEV=     .91
LEAD      T=      .63 NOT SIGNIFICANT EMEAN-CMEAN=     -.60 DEG=  4 EMEAN=    32.63 EDEV=     1.47 CMEAN=    33.23 CDEV=     .76
ZINC      T=      .26 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  4 EMEAN=     4.33 EDEV=      .31 CMEAN=     4.43 CDEV=     .59
            DAY NUMBER   50
CADMIUM   T=      .46 NOT SIGNIFICANT EMEAN-CMEAN=     -.07 DEG=  4 EMEAN=     5.13 EDEV=      .15 CMEAN=     5.20 CDEV=     .20
CHROMIUM T=       .62 NOT SIGNIFICANT EMEAN-CMEAN=      .33 DEG=  4 EMEAN=     8.20 EDEV=      .46 CMEAN=     7.87 CDEV=     .81
COPPER    T=      .80 NOT SIGNIFICANT EMEAN-CMEAN=      .33 DEG=  4 EMEAN=    10.23 EDEV=      .06 CMEAN=     9.90 CDEV=     .72
NICKLE    T=     1.78 NOT SIGNIFICANT EMEAN-CMEAN=    -1.07 DEG=  4 EMEAN=    14.30 EDEV=      .66 CMEAN=    15.37 CDEV=     .80
LEAD      T=     5.23     SIGNIFICANT EMEAN-CMEAN=     2.20 DEG=  4 EMEAN=    48.70 EDEV=      .50 CMEAN=    46.50 CDEV=     .53
ZINC      T=      .38 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  4 EMEAN=     4.47 EDEV=      .32 CMEAN=     4.57 CDEV=     .32
            DAY NUMBER   85
CADMIUM   T=     2.12 NOT SIGNIFICANT EMEAN-CMEAN=     -.10 DEG=  4 EMEAN=     2.23 EDEV=      .06 CMEAN=     2.33 CDEV=     .06
CHROMIUM T=       .76 NOT SIGNIFICANT EMEAN-CMEAN=      .27 DEG=  4 EMEAN=     9.20 EDEV=      .36 CMEAN=     8.93 CDEV=     .49
COPPER    T=      .44 NOT SIGNIFICANT EMEAN-CMEAN=     -.13 DEG=  4 EMEAN=     9.27 EDEV=      .15 CMEAN=     9.40 CDEV=     .50
NICKLE    T=      .81 NOT SIGNIFICANT EMEAN-CMEAN=     -.17 DEG=  4 EMEAN=    13.57 EDEV=      .15 CMEAN=    13.73 CDEV=     .32
LEAD      T=      .80 NOT SIGNIFICANT EMEAN-CMEAN=     1.57 DEG=  4 EMEAN=    50.50 EDEV=      .46 CMEAN=    48.93 CDEV=    3.37
ZINC      T=     1.87 NOT SIGNIFICANT EMEAN-CMEAN=    -1.10 DEG=  4 EMEAN=     3.30 EDEV=      .36 CMEAN=     4.40 CDEV=     .95
            DAY NUMBER  125
CADMIUM    NO CONTROL    MEAN=      2.43 DEVIATION=       .06 NUM= 3
CHROMIUM   NO CONTROL    MEAN=      9.63 DEVIATION=       .12 NUM= 3
COPPER     NO CONTROL    MEAN=      4.45 DEVIATION=       .00 NUM= 3
NICKLE     NO CONTROL    MEAN=     12.67 DEVIATION=       .50 NUM= 3
LEAD       NO CONTROL    MEAN=     42.83 DEVIATION=      3.19 NUM= 3
ZINC       NO CONTROL    MEAN=      4.80 DEVIATION=       .36 NUM= 3
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      OYSTER          INTERNAL        EXPERIMENT NO=2
              DAY NUMBER    0                                                                                      32
CADMIUM    NO EXPERMENT MEAN=      1.77 DEVIATION=       .06 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=     10.40 DEVIATION=       .53 NUM= 3
COPPER     NO EXPERMENT MEAN=     88.60 DEVIATION=      3.00 NUM= 3
NICKLE     NO EXPERMENT MEAN=     19.23 DEVIATION=      1.53 NUM= 3
LEAD       NO EXPERMENT MEAN=      7.23 DEVIATION=      3.14 NUM= 3
ZINC       NO EXPERMENT MEAN=    657.37 DEVIATION=    145.94 NUM= 3
              DAY NUMBER    1
CADMIUM   T=     11.50  SIGNIFICANT     EMEAN-CMEAN=      2.10 DEG=  4 EMEAN=     4.90 EDEV=      .17 CMEAN=     2.80 CDEV=      .26
CHROMIUM  T=      2.50 NOT SIGNIFICANT  EMEAN-CMEAN=     -6.53 DEG=  4 EMEAN=     5.90 EDEV=      .53 CMEAN=    12.43 CDEV=     4.49
COPPER    T=      7.82  SIGNIFICANT     EMEAN-CMEAN=     72.97 DEG=  4 EMEAN=   158.77 EDEV=     5.26 CMEAN=    85.80 CDEV=    15.28
NICKLE    T=      3.15  SIGNIFICANT     EMEAN-CMEAN=    -12.93 DEG=  4 EMEAN=    12.30 EDEV=      .53 CMEAN=    25.23 CDEV=     7.10
LEAD      T=      3.08  SIGNIFICANT     EMEAN-CMEAN=      4.90 DEG=  4 EMEAN=    12.47 EDEV=     2.02 CMEAN=     7.57 CDEV=     1.88
ZINC      T=     13.12  SIGNIFICANT     EMEAN-CMEAN=    425.50 DEG=  4 EMEAN=   920.80 EDEV=    11.33 CMEAN=   495.30 CDEV=    55.03
              DAY NUMBER    5
CADMIUM   T=      8.50  SIGNIFICANT     EMEAN-CMEAN=       .95 DEG=  2 EMEAN=     4.65 EDEV=      .07 CMEAN=     3.70 CDEV=      .14
CHROMIUM  T=      1.58 NOT SIGNIFICANT  EMEAN-CMEAN=      2.65 DEG=  2 EMEAN=    12.95 EDEV=     1.91 CMEAN=    10.30 CDEV=     1.41
COPPER    T=      4.78  SIGNIFICANT     EMEAN-CMEAN=     47.90 DEG=  2 EMEAN=   147.10 EDEV=    14.14 CMEAN=    99.20 CDEV=      .71
NICKLE    T=      1.25 NOT SIGNIFICANT  EMEAN-CMEAN=      3.00 DEG=  2 EMEAN=    22.00 EDEV=     2.55 CMEAN=    19.00 CDEV=     2.26
LEAD      T=       .50 NOT SIGNIFICANT  EMEAN-CMEAN=       .60 DEG=  2 EMEAN=     9.70 EDEV=     1.13 CMEAN=     9.10 CDEV=     1.27
ZINC      T=      2.21 NOT SIGNIFICANT  EMEAN-CMEAN=    112.50 DEG=  2 EMEAN=   642.70 EDEV=    47.28 CMEAN=   530.20 CDEV=    54.45
              DAY NUMBER   25
CADMIUM   T=      3.77  SIGNIFICANT     EMEAN-CMEAN=      1.90 DEG=  4 EMEAN=     5.90 EDEV=      .79 CMEAN=     4.00 CDEV=      .36
CHROMIUM  T=      2.39 NOT SIGNIFICANT  EMEAN-CMEAN=      5.93 DEG=  4 EMEAN=    21.23 EDEV=     3.90 CMEAN=    15.30 CDEV=     1.81
CUPPER    T=      8.51  SIGNIFICANT     EMEAN-CMEAN=     77.20 DEG=  4 EMEAN=   223.60 EDEV=    12.88 CMEAN=   146.40 CDEV=     9.01
NICKLE    T=      2.14 NOT SIGNIFICANT  EMEAN-CMEAN=      8.47 DEG=  4 EMEAN=    26.43 EDEV=     6.70 CMEAN=    17.97 CDEV=     1.50
LEAD      T=      2.92  SIGNIFICANT     EMEAN-CMEAN=      6.30 DEG=  4 EMEAN=    14.63 EDEV=     1.72 CMEAN=     8.33 CDEV=     3.32
ZINC      T=      2.70 NOT SIGNIFICANT  EMEAN-CMEAN=    172.17 DEG=  4 EMEAN=   884.77 EDEV=    98.48 CMEAN=   712.60 CDEV=    49.81
              DAY NUMBER   50
CADMIUM   T=      1.31 NOT SIGNIFICANT  EMEAN-CMEAN=      1.25 DEG=  1 EMEAN=     3.80 EDEV=      .00 CMEAN=     2.55 CDEV=      .78
CHRUMIUM  T=      2.59 NOT SIGNIFICANT  EMEAN-CMEAN=     13.00 DEG=  1 EMEAN=    29.80 EDEV=      .00 CMEAN=    16.80 CDEV=     4.10
COPPER    T=     10.30 NOT SIGNIFICANT  EMEAN-CMEAN=     90.05 DEG=  1 EMEAN=   214.20 EDEV=      .00 CMEAN=   124.15 CDEV=     7.14
NICKLE    T=      6.42 NOT SIGNIFICANT  EMEAN-CMEAN=      9.45 DEG=  1 EMEAN=    25.90 EDEV=      .00 CMEAN=    16.45 CDEV=     1.20
LEAD      T=      3.05 NOT SIGNIFICANT  EMEAN-CMEAN=      5.55 DEG=  1 EMEAN=    10.90 EDEV=      .00 CMEAN=     5.35 CDEV=     1.48
ZINC      T=      2.44 NOT SIGNIFICANT  EMEAN-CMEAN=    132.90 DEG=  1 EMEAN=   842.40 EDEV=      .00 CMEAN=   709.50 CDEV=    44.55
              DAY NUMBER   85
CADMIUM   T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=      4.[illegible] DEG=  0 EMEAN=     7.40 EDEV=      .00 CMEAN=     2.80 CDEV=      .00
CHRJMIUM  T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=     11.40 DEG=  0 EMEAN=    18.40 EDEV=      .00 CMEAN=     7.00 CDEV=      .00
COPPER    T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=    421.50 DEG=  0 EMEAN=   720.80 EDEV=      .00 CMEAN=   299.30 CDEV=      .00
NICKLE    T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=     14.00 DEG=  0 EMEAN=    25.00 EDEV=      .00 CMEAN=    11.00 CDEV=      .00
LEAD      T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=     16.70 DEG=  0 EMEAN=    23.70 EDEV=      .00 CMEAN=     7.00 CDEV=      .00
ZINC      T=       .00 NOT SIGNIFICANT  EMEAN-CMEAN=   1651.70 DEG=  0 EMEAN=  2386.90 EDEV=      .00 CMEAN=   735.20 CDEV=      .00
              DAY NUMBER  125
CADMIUM   T=      3.66 NOT SIGNIFICANT  EMEAN-CMEAN=       .95 DEG=  1 EMEAN=     3.45 EDEV=      .21 CMEAN=     2.50 CDEV=      .00
CHROMIUM  T=      1.63 NOT SIGNIFICANT  EMEAN-CMEAN=     11.15 DEG=  1 EMEAN=    28.35 EDEV=     5.59 CMEAN=    17.20 CDEV=      .00
COPPER    T=      1.46 NOT SIGNIFICANT  EMEAN-CMEAN=     91.90 DEG=  1 EMEAN=   336.40 EDEV=    51.34 CMEAN=   244.50 CDEV=      .00
NICKLE    T=      1.64 NOT SIGNIFICANT  EMEAN-CMEAN=      8.50 DEG=  1 EMEAN=    25.40 EDEV=     4.24 CMEAN=    16.90 CDEV=      .00
LEAD      T=      2.74 NOT SIGNIFICANT  EMEAN-CMEAN=      9.25 DEG=  1 EMEAN=    14.35 EDEV=     2.76 CMEAN=     5.10 CDEV=      .00
ZINC      T=      5.46 NOT SIGNIFICANT  EMEAN-CMEAN=    637.10 DEG=  1 EMEAN=  1028.60 EDEV=    95.32 CMEAN=   391.50 CDEV=      .00
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    OYSTER         SHELL          EXPERIMENT NO=2
           DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=      3.07 DEVIATION=        .06 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=      7.47 DEVIATION=        .15 NUM= 3
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=        .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=     18.27 DEVIATION=        .42 NUM= 3
LEAD       NO EXPERMENT MEAN=     38.17 DEVIATION=        .45 NUM= 3
ZINC       NO EXPERMENT MEAN=      3.60 DEVIATION=        .46 NUM= 3
           DAY NUMBER    1
CADMIUM  T=       .29 NOT SIGNIFICANT EMEAN-CMEAN=      .07 DEG=  4 EMEAN=     3.10 EDEV=      .10 CMEAN=     3.03 CDEV=       .38
CHROMIUM T=      3.25  SIGNIFICANT    EMEAN-CMEAN=    -2.30 DEG=  4 EMEAN=     9.20 EDEV=      .87 CMEAN=    11.50 CDEV=       .87
COPPER   T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=     1.58 DEG=  4 EMEAN=     6.03 EDEV=     2.74 CMEAN=     4.45 CDEV=       .00
NICKLE   T=     10.58  SIGNIFICANT    EMEAN-CMEAN=    -4.07 DEG=  4 EMEAN=    17.20 EDEV=      .53 CMEAN=    21.27 CDEV=       .40
LEAD     T=       .78 NOT SIGNIFICANT EMEAN-CMEAN=     -.63 DEG=  4 EMEAN=    36.07 EDEV=      .72 CMEAN=    36.70 CDEV=      1.21
ZINC     T=      6.76  SIGNIFICANT    EMEAN-CMEAN=    -6.03 DEG=  4 EMEAN=     4.03 EDEV=      .21 CMEAN=    10.07 CDEV=      1.53
           DAY NUMBER    5
CADMIUM  T=       .94 NOT SIGNIFICANT EMEAN-CMEAN=     -.33 DEG=  4 EMEAN=     3.03 EDEV=      .40 CMEAN=     3.37 CDEV=       .46
CHROMIUM T=       .66 NOT SIGNIFICANT EMEAN-CMEAN=     -.23 DEG=  4 EMEAN=    12.90 EDEV=      .26 CMEAN=    13.13 CDEV=       .55
COPPER   T=      1.51 NOT SIGNIFICANT EMEAN-CMEAN=     -.27 DEG=  4 EMEAN=     9.60 EDEV=      .00 CMEAN=     9.87 CDEV=       .31
NICKLE   T=      1.19 NOT SIGNIFICANT EMEAN-CMEAN=    -1.60 DEG=  4 EMEAN=    17.63 EDEV=     1.58 CMEAN=    19.23 CDEV=      1.70
LEAD     T=       .74 NLT SIGNIFICANT EMEAN-CMEAN=     -.87 DEG=  4 EMEAN=    33.77 EDEV=     1.76 CMEAN=    34.63 CDEV=      1.01
ZINC     T=      2.02 NOT SIGNIFICANT EMEAN-CMEAN=     2.00 DEG=  4 EMEAN=     8.70 EDEV=     1.54 CMEAN=     6.70 CDEV=       .75
           DAY NUMBER   25
CADMIUM  T=      3.46  SIGNIFICANT    EMEAN-CMEAN=      .40 DEG=  4 EMEAN=     3.10 EDEV=      .17 CMEAN=     2.70 CDEV=       .10
CHROMIUM T=      4.07  SIGNIFICANT    EMEAN-CMEAN=    -3.17 DEG=  4 EMEAN=    12.30 EDEV=      .40 CMEAN=    15.47 CDEV=      1.29
COPPER   T=      2.00 NOT SIGNIFICANT EMEAN-CMEAN=    -3.20 DEG=  4 EMEAN=     4.45 EDEV=      .00 CMEAN=     7.65 CDEV=      2.78
NICKLE   T=      2.22 NOT SIGNIFICANT EMEAN-CMEAN=    -3.08 DEG=  4 EMEAN=    15.03 EDEV=     1.18 CMEAN=    18.07 CDEV=      2.05
LEAD     T=       .39 NOT SIGNIFICANT EMEAN-CMEAN=    -1.50 DEG=  4 EMEAN=    33.87 EDEV=     3.37 CMEAN=    35.37 CDEV=      5.34
ZINC     T=      3.61  SIGNIFICANT    EMEAN-CMEAN=    -1.00 DEG=  4 EMEAN=     5.70 EDEV=      .20 CMEAN=     6.70 CDEV=       .44
           DAY NUMBER   50
CADMIUM  T=       .25 NOT SIGNIFICANT EMEAN-CMEAN=      .03 DEG=  4 EMEAN=     1.83 EDEV=      .12 CMFAN=     1.80 CDEV=       .20
CHROMIUM T=      1.00 NOT SIGNIFICANT EMEAN-CMEAN=      .47 DEG=  4 EMEAN=    10.17 EDEV=      .59 CMEAN=     9.70 CDEV=       .56
COPPER                EMEAN=CMEAN                               EMEAN=     4.45  EDEV=      .59  CMEAN=     4.45CDEV=    .00
NICKLE   T=       .42 NOT SIGNIFICANT EMEAN-CMEAN=      .23 DEG=  4 EMEAN=    13.60 EDEV=      .70 CMEAN=    13.37 CDEV=       .65
LEAD     T=       .62 NOT SIGNIFICANT EMEAN-CMEAN=     1.13 DEG=  4 EMEAN=    47.70 EDEV=     2.72 CMEAN=    46.57 CDEV=      1.57
ZINC     T=       .68 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  4 EMEAN=     7.13 EDEV=      .29 CMEAN=     6.93 CDEV=       .42
           DAY NUMBER   85
CADMIUM  T=      1.89 NOT SIGNIFICANT EMEAN-CMEAN=     -.17 DEG=  4 EMEAN=     1.63 EDEV=      .12 CMEAN=     1.80 CDEV=       .10
CHROMIUM T=      1.34 NOT SIGNIFICANT EMEAN-CMEAN=      .90 DEG=  4 EMEAN=    12.87 EDEV=      .72 CMEAN=    11.97 CDEV=       .91
COPPER   T=      5.24  SIGNIFICANT    EMEAN-CMEAN=     2.17 DEG=  4 EMEAN=    13.10 EDEV=      .46 CMEAN=    10.93 CDEV=       .55
NICKLE   T=       .23 NOT SIGNIFICANT EMEAN-CMEAN=      .20 DEG=  4 EMEAN=    14.70 EDEV=      .46 CMEAN=    14.50 CDEV=      1.41
LEAD     T=       .77 NOT SIGNIFICANT EMEAN-CMEAN=     -.70 DEG=  4 EMEAN=    50.23 EDEV=     1.42 CMEAN=    50.93 CDEV=       .70
ZINC     T=      2.61 NOT SIGNIFICANT EMEAN-CMEAN=     2.77 DEG=  4 EMEAN=    18.47 EDEV=     1.70 CMEAN=    15.70 CDEV=       .69
           DAY NUMBER  125
CADMIUM  T=       .71 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     2.33 EDEV=      .06 CMEAN=     2.37 CDEV=       .06
CHROMIUM T=      4.11  SIGNIFICANT    EMEAN-CMEAN=     3.03 DEG=  4 EMEAN=    24.33 EDEV=     1.17 CMEAN=    21.30 CDEV=       .52
COPPER   T=      1.37 NOT SIGNIFICANT EMEAN-CMEAN=      .60 DEG=  4 EMEAN=    10.37 EDEV=      .75 CMEAN=     9.77 CDEV=       .13
NICKLE   T=      5.72  SIGNIFICANT    EMEAN-CMEAN=     3.03 DEG=  4 EMEAN=    24.13 EDEV=      .76 CMEAN=    21.10 CDEV=       .52
LEAD     T=       .30 NOT SIGNIFICANT EMEAN-CMEAN=     1.20 DEG=  4 EMEAN=    40.40 EDEV=     5.31 CMEAN=    39.20 CDEV=      4.61
ZINC     T=     13.46  SIGNIFICANT    EMEAN-CMEAN=     5.80 DEG=  4 EMEAN=    16.67 EDEV=      .38 CMEAN=    10.87 CDEV=       .64
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      FOULING ORGANISMS          EXPERIMENT NO=2
         DAY NUMBER  25                                                                                                    34
CADMIUM  T=     6.36  SIGNIFICANT     EMEAN-CMEAN=     .30 DEG=  4 EMEAN=     1.83 EDEV=     .06 CMEAN=     1.53 CDEV=     .06
CHROMIUM T=     2.19 NOT SIGNIFICANT EMEAN-CMEAN=   65.40 DEG=  4 EMEAN=   445.23 EDEV=   51.53 CMEAN=   379.83 CDEV=    3.43
COPPER   T=     1.71 NOT SIGNIFICANT EMEAN-CMEAN=   -3.27 DEG=  4 EMEAN=    49.13 EDEV=    1.89 CMEAN=    52.40 CDEV=    2.71
NICKLE   T=     3.74  SIGNIFICANT     EMEAN-CMEAN=   54.50 DEG=  4 EMEAN=   337.10 EDEV=   17.87 CMEAN=   282.60 CDEV=   17.87
LEAD     T=    15.32  SIGNIFICANT     EMEAN-CMEAN=   23.73 DEG=  4 EMEAN=    37.07 EDEV=    2.21 CMEAN=    13.33 CDEV=    1.53
ZINC     T=      .63 NOT SIGNIFICANT EMEAN-CMEAN=   -3.23 DEG=  4 EMEAN=    75.50 EDEV=    3.36 CMEAN=    78.73 CDEV=    8.17
         DAY NUMBER  50
CADMIUK  T=     3.27  SIGNIFICANT     EMEAN-CMEAN=     .50 DEG=  4 EMEAN=     2.10 EDEV=     .17 CMEAN=     1.60 CDEV=     .20
CHROMIUM T=     7.03  SIGNIFICANT     EMEAN-CMEAN=   92.53 DEG=  4 EMEAN=   523.10 EDEV=   21.99 CMEAN=   430.57 CDEV=    6.01
COPPER   T=      .41 NOT SIGNIFICANT EMEAN-CMEAN=   -1.67 DEG=  4 EMEAN=    56.70 EDEV=    1.84 CMEAN=    58.37 CDEV=    6.84
NICKLE   T=     4.87  SIGNIFICANT     EMEAN-CMEAN=   56.43 DEG=  4 EMEAN=   348.80 EDEV=   18.41 CMEAN=   292.37 CDEV=    8.03
LEAD     T=    22.34  SIGNIFICANT     EMEAN-CMEAN=   33.10 DEG=  3 EMEAN=    44.80 EDEV=    1.13 CMEAN=    11.70 CDEV=    1.82
ZINC     T=      .54 NOT SIGNIFICANT EMEAN-CMEAN=    3.60 DEG=  4 EMEAN=    83.33 EDEV=    7.35 CMEAN=    79.73 CDEV=    9.01
         DAY NUMBER  85
CADMIUM  T=      .18 NOT SIGNIFICANT EMEAN-CMEAN=    -.03 DEG=  4 EMEAN=     1.90 EDEV=     .00 CMEAN=     1.93 CDEV=     .32
CHROMIUM T=     6.43  SIGNIFICANT     EMEAN-CMEAN=  156.63 DEG=  4 EMEAN=   387.10 EDEV=   10.04 CMEAN=   230.47 CDEV=   40.99
COPPER   T=     3.75  SIGNIFICANT     EMEAN-CMEAN=   11.13 DEG=  4 EMEAN=    86.07 EDEV=     .45 CMEAN=    74.93 CDEV=    5.12
NICKLE   T=     4.37  SIGNIFICANT     EMEAN-CMEAN=   37.53 DEG=  4 EMEAN=   268.07 EDEV=    2.11 CMEAN=   230.53 CDEV=   14.72
LEAD     T=    69.53  SIGNIFICANT     EMEAN-CMEAN=   52.13 DEG=  4 EMEAN=    82.27 EDEV=    1.16 CMEAN=    30.13 CDEV=     .59
ZINC     T=    15.79  SIGNIFICANT     EMEAN-CMEAN=   35.90 DEG=  4 EMEAN=    83.63 EDEV=    1.19 CMEAN=    47.73 CDEV=    3.75
         DAY NUMBER 125
CADMIUM   NO EXPERMENT MEAN=      1.93 DEVIATION=      .06 NUM= 3
CHROMIUM  NO EXPERMENT MEAN=    217.40 DEVIATION=    12.92 NUM= 3
COPPER    NO EXPERMENT MEAN=     46.27 DEVIATION=     1.55 NUM= 3
NICKLE    NO EXPERMENT MEAN=    227.67 DEVIATION=     2.93 NUM= 3
LEAD      NO EXPERMENT MEAN=     20.03 DEVIATION=      .71 NUM= 3
ZINC      NO EXPERMENT MEAN=     60.80 DEVIATION=     2.69 NUM= 3
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     SEWAGE                              EXPERIMENT NO=2
               DAY NUMBER    0
 CADMIUM       NO EXPERMENT MEAN=     165.97 DEVIATION=      85.45 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    3666.87 DEVIATION=     338.46 NUM= 3
 COPPER        NO EXPERMENT MEAN=    2445.33 DEVIATION=     266.43 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     375.60 DEVIATION=      12.67 NUM= 3
 LEAD          NO EXPERMENT MEAN=      21.40 DEVIATION=       3.29 NUM= 3
 ZINC          NO EXPERMENT MEAN=    2507.60 DEVIATION=     122.13 NUM= 3
               DAY NUMBER    1
 CADMIUM       NO EXPERMENT MEAN=      58.33 DEVIATION=       8.07 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    1567.57 DEVIATION=     272.14 NUM= 3
 COPPER        NO EXPERMENT MEAN=    1374.40 DEVIATION=     183.97 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     279.40 DEVIATION=      36.28 NUM= 3
 LEAD          NO EXPERMENT MEAN=      21.03 DEVIATION=       4.87 NUM= 3
 ZINC          NO EXPERMENT MEAN=    1193.80 DEVIATION=     154.57 NUM= 3
               DAY NUMBER    5
 CADMIUM       NO EXPERMENT MEAN=      58.97 DEVIATION=       5.13 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    1979.43 DEVIATION=     198.34 NUM= 3
 COPPER        NO EXPERMENT MEAN=    1016.17 DEVIATION=      36.58 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     324.40 DEVIATION=      15.70 NUM= 3
 LEAD          NO EXPERMENT MEAN=      18.17 DEVIATION=       4.24 NUM= 3
 ZINC          NO EXPERMENT MEAN=    1261.57 DEVIATION=     278.32 NUM= 3
               DAY NUMBER   25
 CADMIUM       NO EXPERMENT MEAN=      51.57 DEVIATION=       5.55 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    1845.97 DEVIATION=     307.45 NUM= 3
 COPPER        NO EXPERMENT MEAN=    1306.80 DEVIATION=     304.00 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     245.43 DEVIATION=      18.41 NUM= 3
 LEAD          NO EXPERMENT MEAN=      34.03 DEVIATION=      14.56 NUM= 3
 ZINC          NO EXPERMENT MEAN=    1205.63 DEVIATION=     238.87 NUM= 3
               DAY NUMBER   50
 CADMIUM       NO EXPERMENT MEAN=      66.50 DEVIATION=       8.32 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    1979.07 DEVIATION=     141.88 NUM= 3
 COPPER        NO EXPERMENT MEAN=    1449.63 DEVIATION=      37.69 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     229.60 DEVIATION=      12.66 NUM= 3
 LEAD          NO EXPERMENT MEAN=      57.17 DEVIATION=       5.46 NUM= 3
 ZINC          NO EXPERMENT MEAN=    1444.57 DEVIATION=      74.36 NUM= 3
               DAY NUMBER   65
 CADMIUM       NO EXPERMENT MEAN=      31.13 DEVIATION=       8.56 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=    1253.47 DEVIATION=      32.51 NUM= 3
 COPPER        NO EXPERMENT MEAN=     884.53 DEVIATION=       9.31 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     237.80 DEVIATION=      17.57 NUM= 3
 LEAD          NO EXPERMENT MEAN=      77.57 DEVIATION=      16.23 NUM= 3
 ZINC          NO EXPERMENT MEAN=     857.17 DEVIATION=      70.63 NUM= 3
               DAY NUMBER 125
 CADMIUM       NO EXPERMENT MEAN=      17.97 DEVIATION=       1.04 NUM= 3
 CHROMIUM      NO EXPERMENT MEAN=     658.73 DEVIATION=       8.11 NUM= 3
 COPPER        NO EXPERMENT MEAN=     502.50 DEVIATION=      57.23 NUM= 3
 NICKLE        NO EXPERMENT MEAN=     139.57 DEVIATION=       9.31 NUM= 3
 LEAD          NO EXPERMENT MEAN=      19.90 DEVIATION=        .00 NUM= 3
 ZINC          NO EXPERMENT MEAN=     431.40 DEVIATION=      22.85 NUM= 3
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     SEDIMENT
          DAY NUMBER    0          EXPERIMENT NU=2                                                              36
CADMIUM                       EMEAN=CMEAN                                     EMEAN=      .60  EDEV=   1.19  CMEAN=      .60CDEV=    .00
CHROMIUM T=       1.46 NOT SIGNIFICANT EMEAN-CMEAN=    -.33 DEG=  4 EMEAN=     6.83 EDEV=    .25 CMEAN=     7.17 CDEV=     .31
COPPER                        EMEAN=CMEAN                                     EMEAN=     4.45  EDEV=    .25  CMEAN=     4.45CDEV=    .00
NICKLE   T=       9.50  SIGNIFICANT    EMEAN-CMEAN=   -2.10 DEG=  4 EMEAN=     7.27 EDEV=    .21 CMEAN=     9.37 CDEV=     .32
LEAD     T=       8.00  SIGNIFICANT    EMEAN-CMEAN=   -1.10 DEG=  4 EMEAN=     6.63 EDEV=    .06 CMEAN=     7.73 CDEV=     .23
ZINC     T=        .40 NOT SIGNIFICANT EMEAN-CMEAN=    -.07 DEG=  4 EMEAN=    16.13 EDEV=    .12 CMEAN=    16.20 CDEV=     .26
          DAY NUMBER    1
CADMIUM                       EMEAN=CMEAN                                     EMEAN=      .57  EDEV=    .12  CMEAN=      .57CDEV=    .06
CHROMIUM T=       7.18  SIGNIFICANT    EMEAN-CMEAN=   -1.27 DEG=  4 EMEAN=     5.70 EDEV=    .26 CMEAN=     6.97 CDEV=     .15
COPPER                        EMEAN=CMEAN                                     EMEAN=     4.45  EDEV=    .26  CMEAN=     4.45CDEV=    .00
NICKLE   T=        .18 NOT SIGNIFICANT EMEAN-CMEAN=    -.17 DEG=  4 EMEAN=     6.13 EDEV=    .06 CMEAN=     6.30 CDEV=    1.65
LEAD     T=       1.57 NOT SIGNIFICANT EMEAN-CMEAN=     .27 DEG=  4 EMEAN=     6.93 EDEV=    .25 CMEAN=     6.67 CDEV=     .15
ZINC     T=       1.38 NOT SIGNIFICANT EMEAN-CMEAN=    -.73 DEG=  4 EMEAN=    15.20 EDEV=    .35 CMEAN=    15.93 CDEV=     .85
          DAY NUMBER    5
CADMIUM  T=        .38 NOT SIGNIFICANT EMEAN-CMEAN=    -.03 DEG=  4 EMEAN=      .25 EDEV=    .09 CMEAN=      .28 CDEV=     .13
CHROMIUM T=       1.36 NOT SIGNIFICANT EMEAN-CMEAN=   -1.07 DEG=  4 EMEAN=     5.67 EDEV=    .40 CMEAN=     6.73 CDEV=    1.30
COPPER                        EMEAN=CMEAN                                     EMEAN=     4.45  EDEV=    .40  CMEAN=     4.45CDEV=    .00
NICKLE   T=       2.54 NOT SIGNIFICANT EMEAN-CMEAN=   -1.67 DEG=  4 EMEAN=     4.30 EDEV=    .30 CMEAN=     5.97 CDEV=    1.10
LEAD     T=       1.85 NOT SIGNIFICANT EMEAN-CMEAN=   -1.30 DEG=  4 EMEAN=     5.23 EDEV=    .25 CMEAN=     6.53 CDEV=    1.19
ZINC     T=        .14 NOT SIGNIFICANT EMEAN-CMEAN=     .20 DEG=  4 EMEAN=    14.00 EDEV=   2.23 CMEAN=    13.80 CDEV=    1.05
          DAY NUMBER   25
CADMIUM                       EMEAN=CMEAN                                     EMEAN=      .47  EDEV=   2.23  CMEAN=      .47CDEV=    .06
CHROMIUM T=       2.54 NOT SIGNIFICANT EMEAN-CMEAN=    -.90 DEG=  4 EMEAN=     6.97 EDEV=    .46 CMEAN=     7.87 CDEV=     .40
COPPER   T=       2.56 NOT SIGNIFICANT EMEAN-CMEAN=    -.67 DEG=  4 EMEAN=     9.13 EDEV=    .40 CMEAN=     9.80 CDEV=     .20
NICKLE   T=       8.76  SIGNIFICANT    EMEAN-CMEAN=   -1.80 DEG=  4 EMEAN=     7.07 EDEV=    .35 CMEAN=     8.87 CDEV=     .06
LEAD     T=        .08 NOT SIGNIFICANT EMEAN-CMEAN=     .03 DEG=  4 EMEAN=     6.93 EDEV=    .59 CMEAN=     6.90 CDEV=     .36
ZINC     T=       2.05 NOT SIGNIFICANT EMEAN-CMEAN=   -1.40 DEG=  4 EMEAN=    14.50 EDEV=    .80 CMEAN=    15.90 CDEV=     .87
          DAY NUMBER   50
CADMIUM  T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=    -.10 DEG=  4 EMEAN=      .30 EDEV=    .00 CMEAN=      .40 CDEV=     .17
CHROMIUM T=        .90 NOT SIGNIFICANT EMEAN-CMEAN=     .40 DEG=  4 EMEAN=     6.97 EDEV=    .42 CMEAN=     6.57 CDEV=     .64
COPPER   T=        .09 NOT SIGNIFICANT EMEAN-CMEAN=     .20 DEG=  4 EMEAN=     6.13 EDEV=   2.92 CMEAN=     5.93 CDEV=    2.57
NICKLE   T=       1.71 NOT SIGNIFICANT EMEAN-CMEAN=     .67 DEG=  4 EMEAN=     7.97 EDEV=    .64 CMEAN=     7.30 CDEV=     .20
LEAD     T=       1.82 NOT SIGNIFICANT EMEAN-CMEAN=     .63 DEG=  4 EMEAN=     5.53 EDEV=    .45 CMEAN=     4.90 CDEV=     .40
ZINC     T=       3.13  SIGNIFICANT    EMEAN-CMEAN=    4.53 DEG=  4 EMEAN=    16.60 EDEV=   1.78 CMEAN=    12.07 CDEV=    1.77
          DAY NUMBER   85
CADMIUM                       EMEAN=CMEAN                                     EMEAN=      .20  EDEV=   1.78  CMEAN=      .20CDEV=    .09
CHROMIUM T=        .33 NOT SIGNIFICANT EMEAN-CMEAN=    -.50 DEG=  4 EMEAN=    42.17 EDEV=   2.40 CMEAN=    42.67 CDEV=    1.05
COPPER                        EMEAN=CMEAN                                     EMEAN=     4.45  EDEV=   2.40  CMEAN=     4.45CDEV=    .00
NICKLE   T=        .90 NOT SIGNIFICANT EMEAN-CMEAN=    -.30 DEG=  4 EMEAN=     8.03 EDEV=    .40 CMEAN=     8.33 CDEV=     .42
LEAD     T=       1.30 NOT SIGNIFICANT EMEAN-CMEAN=     .43 DEG=  4 EMEAN=     7.20 EDEV=    .46 CMEAN=     6.77 CDEV=     .35
ZINC     T=        .65 NOT SIGNIFICANT EMEAN-CMEAN=    -.33 DEG=  4 EMEAN=    15.13 EDEV=    .25 CMEAN=    15.47 CDEV=     .85
          DAY NUMBER  125
CADMIUM                       EMEAN=CMEAN                                     EMEAN=      .37  EDEV=    .25  CMEAN=      .37CDEV=    .06
CHROMIUM T=       1.11 NOT SIGNIFICANT EMEAN-CMEAN=    1.47 DEG=  4 EMEAN=    53.47 EDEV=   1.27 CMEAN=    52.00 CDEV=    1.91
COPPER                        EMEAN=CMEAN                                     EMEAN=     4.45  EDEV=   1.27  CMEAN=     4.45CDEV=    .00
NICKLE   T=       2.96  SIGNIFICANT    EMEAN-CMEAN=     .90 DEG=  4 EMEAN=    11.27 EDEV=    .47 CMEAN=    10.37 CDEV=     .23
LEAD     T=       5.80  SIGNIFICANT    EMEAN-CMEAN=    1.00 DEG=  4 EMEAN=     8.17 EDEV=    .31 CMEAN=     7.17 CDEV=     .12
ZINC     T=       4.30  SIGNIFICANT    EMEAN-CMEAN=    2.10 DEG=  4 EMEAN=    17.53 EDEV=    .61 CMEAN=    15.43 CDEV=     .59
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     THALASSL     LEAF          EXPERIMENT NO=2
           DAY NUMBER    0
CADMIUM    NO EXPERMENT MEAN=     1.10 DEVIATION=      .10 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=    16.13 DEVIATION=      .57 NUM= 3
COPPER     NO EXPERMENT MEAN=     4.45 DEVIATION=      .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=    29.40 DEVIATION=     1.30 NUM= 3
LEAD       NO EXPERMENT MEAN=    10.07 DEVIATION=      .64 NUM= 3
ZINC       NO EXPERMENT MEAN=    27.63 DEVIATION=      .91 NUM= 3
           DAY NUMBER    1
CADMIUM  T=       .89 NOT SIGNIFICANT EMEAN-CMEAN=      .25 DEG=  3 EMEAN=     1.70 EDEV=      .35 CMEAN=     1.45 CDEV=      .21
CHROMIUM T=      2.28 NOT SIGNIFICANT EMEAN-CMEAN=     2.32 DEG=  3 EMEAN=    15.47 EDEV=     1.14 CMEAN=    13.15 CDEV=     1.06
COPPER   T=      1.49 NOT SIGNIFICANT EMEAN-CMEAN=      .72 DEG=  3 EMEAN=    10.87 EDEV=      .64 CMEAN=    10.15 CDEV=      .07
NICKLE   T=      7.72  SIGNIFICANT    EMEAN-CMEAN=     3.50 DEG=  3 EMEAN=    24.20 EDEV=      .35 CMEAN=    20.70 CDEV=      .71
LEAD     T=     10.42  SIGNIFICANT    EMEAN-CMEAN=     5.60 DEG=  3 EMEAN=    12.20 EDEV=      .52 CMEAN=     6.60 CDEV=      .71
ZINC     T=       .24 NOT SIGNIFICANT EMEAN-CMEAN=     -.37 DEG=  3 EMEAN=    25.83 EDEV=      .93 CMEAN=    26.20 CDEV=     2.55
           DAY NUMBER    5
CADMIUM  T=       .80 NOT SIGNIFICANT EMEAN-CMEAN=      .23 DEG=  4 EMEAN=     2.30 EDEV=      .46 CMEAN=     2.07 CDEV=      .21
CHRUMIUM T=      4.40  SIGNIFICANT    EMEAN-CMEAN=    14.03 DEG=  4 EMEAN=    53.30 EDEV=     5.24 CMEAN=    39.27 CDEV=     1.75
COPPER   T=      8.59  SIGNIFICANT    EMEAN-CMEAN=     3.73 DEG=  4 EMEAN=    18.97 EDEV=      .72 CMEAN=    15.23 CDEV=      .21
NICKLE   T=      9.65  SIGNIFICANT    EMEAN-CMEAN=    14.40 DEG=  4 EMEAN=    56.63 EDEV=     2.31 CMEAN=    42.23 CDEV=     1.15
LEAD     T=      4.50  SIGNIFICANT    EMEAN-CMEAN=     4.80 DEG=  4 EMEAN=    14.27 EDEV=     1.72 CMEAN=     9.47 CDEV=      .67
ZINC     T=       .35 NOT SIGNIFICANT EMEAN-CMEAN=      .80 DEG=  4 EMEAN=    37.33 EDEV=     2.62 CMEAN=    36.53 CDEV=     2.97
           DAY NUMBER   25
CADMIUM  T=      4.16  SIGNIFICANT    EMEAN-CMEAN=      .57 DEG=  3 EMEAN=     4.20 EDEV=      .14 CMEAN=     3.63 CDEV=      .15
CHROMIUM T=     23.57  SIGNIFICANT    EMEAN-CMEAN=    -5.37 DEG=  3 EMEAN=    32.00 EDEV=      .28 CMEAN=    37.37 CDEV=      .23
COPPER   T=      6.54  SIGNIFICANT    EMEAN-CMEAN=    -2.42 DEG=  3 EMEAN=    20.15 EDEV=      .64 CMEAN=    22.57 CDEV=      .21
NICKLE   T=     17.56  SIGNIFICANT    EMEAN-CMEAN=   -12.23 DEG=  3 EMEAN=    29.50 EDEV=     1.27 CMEAN=    41.73 CDEV=      .25
LEAD     T=     10.73  SIGNIFICANT    EMEAN-CMEAN=     7.60 DEG=  3 EMEAN=     7.85 EDEV=     1.34 CMEAN=      .25 CDEV=      .00
ZINC     T=      8.83  SIGNIFICANT    EMEAN-CMEAN=    -8.87 DEG=  3 EMEAN=    23.20 EDEV=      .57 CMEAN=    32.07 CDEV=     1.29
           DAY NUMBER   50
CADMIUM  T=      8.19  SIGNIFICANT    EMEAN-CMEAN=     3.10 DEG=  4 EMEAN=     5.80 EDEV=      .66 CMEAN=     2.70 CDEV=      .00
CHROMIUM T=      4.93  SIGNIFICANT    EMEAN-CMEAN=   -16.40 DEG=  4 EMEAN=    39.53 EDEV=     4.54 CMEAN=    55.93 CDEV=     3.54
COPPER   T=      2.59 NOT SIGNIFICANT EMEAN-CMEAN=     5.70 DEG=  4 EMEAN=    30.60 EDEV=     3.80 CMEAN=    24.90 CDEV=      .10
NICKLE   T=      8.67  SIGNIFICANT    EMEAN-CMEAN=   -17.13 DEG=  4 EMEAN=    27.10 EDEV=     3.42 CMEAN=    44.23 CDEV=      .15
LEAD     T=      5.27  SIGNIFICANT    EMEAN-CMEAN=     3.67 DEG=  4 EMEAN=    13.77 EDEV=      .91 CMEAN=    10.10 CDEV=      .79
ZINC     T=      1.08 NOT SIGNIFICANT EMEAN-CMEAN=     6.70 DEG=  4 EMEAN=    47.07 EDEV=     6.07 CMEAN=    40.37 CDEV=     1.11
           DAY NUMBER   85
CADMIUM  T=      8.84  SIGNIFICANT    EMEAN-CMEAN=      .83 DEG=  4 EMEAN=     3.47 EDEV=      .12 CMEAN=     2.63 CDEV=      .12
CHROMIUM T=     17.41  SIGNIFICANT    EMEAN-CMEAN=    79.87 DEG=  4 EMEAN=   124.87 EDEV=     6.91 CMEAN=    45.00 CDEV=     3.91
COPPER   T=     11.36  SIGNIFICANT    EMEAN-CMEAN=     5.77 DEG=  4 EMEAN=    29.17 EDEV=      .12 CMEAN=    23.40 CDEV=      .87
NICKLE   T=     53.12  SIGNIFICANT    EMEAN-CMEAN=    42.90 DEG=  4 EMEAN=    73.67 EDEV=      .31 CMEAN=    30.77 CDEV=     1.37
LEAD     T=       .59 NOT SIGNIFICANT EMEAN-CMEAN=      .13 DEG=  4 EMEAN=     6.60 EDEV=      .26 CMEAN=     6.47 CDEV=      .29
ZINC     T=      3.13  SIGNIFICANT    EMEAN-CMEAN=     6.87 DEG=  4 EMEAN=    31.80 EDEV=      .62 CMEAN=    24.93 CDEV=     3.75
           DAY NUMBER  125
CADMIUM  T=**********  SIGNIFICANT    EMEAN-CMEAN=     2.30 DEG=  2 EMEAN=     3.50 EDEV=      .00 CMEAN=     1.20 CDEV=      .00
CHROMIUM T=      9.37  SIGNIFICANT    EMEAN-CMEAN=    21.97 DEG=  2 EMEAN=    73.20 EDEV=      .00 CMEAN=    51.23 CDEV=     2.03
COPPER   T=     16.62  SIGNIFICANT    EMEAN-CMEAN=    14.53 DEG=  2 EMEAN=    29.60 EDEV=      .00 CMEAN=    15.07 CDEV=      .76
NICKLE   T=     13.87  SIGNIFICANT    EMEAN-CMEAN=     7.57 DEG=  2 EMEAN=    36.60 EDEV=      .00 CMEAN=    29.03 CDEV=      .47
LEAD                    EMEAN=CMEAN                               EMEAN=      .25  EDEV=   .00  CMEAN=       .25CDEV=   .00
ZINC     T=      3.12 NOT SIGNIFICANT EMEAN-CMEAN=     3.30 DEG=  2 EMEAN=    15.00 EDEV=      .00 CMEAN=    11.70 CDEV=      .92
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        THALASSL     ROOT          EXPERIMENT NO=2
             DAY NUMBER    0                                                                  38
CADMIUM    NO EXPERMENT MEAN=      1.20 DEVIATION=       .10 NUM= 3
CHROMIUM   NO EXPERMENT MEAN=     17.80 DEVIATION=      1.15 NUM= 3
COPPER     NO EXPERMENT MEAN=      4.45 DEVIATION=       .00 NUM= 3
NICKLE     NO EXPERMENT MEAN=     26.47 DEVIATION=       .98 NUM= 3
LEAD       NO EXPERMENT MEAN=     10.13 DEVIATION=      1.53 NUM= 3
ZINC       NO EXPERMENT MEAN=     34.93 DEVIATION=       .21 NUM= 3
             DAY NUMBER    1
CADMIUM  T=      1.77 NOT SIGNIFICANT EMEAN-CMEAN=      .17 DEG=  4 EMEAN=     1.23 EDEV=      .06 CMEAN=     1.07 CDEV=      .15
CHROMIUM T=      1.80 NOT SIGNIFICANT EMEAN-CMEAN=     2.23 DEG=  4 EMEAN=    24.33 EDEV=     1.36 CMEAN=    22.10 CDEV=     1.67
COPPER   T=       .44 NOT SIGNIFICANT EMEAN-CMEAN=      .40 DEG=  4 EMEAN=    10.53 EDEV=     1.30 CMEAN=    10.13 CDEV=      .86
NICKLE   T=      2.69 NOT SIGNIFICANT EMEAN-CMEAN=     4.83 DEG=  4 EMEAN=    32.80 EDEV=     1.30 CMEAN=    27.97 CDEV=     2.83
LEAD     T=     14.63  SIGNIFICANT    EMEAN-CMEAN=     7.67 DEG=  4 EMEAN=    15.97 EDEV=      .74 CMEAN=     8.30 CDEV=      .53
ZINC     T=       .03 NOT SIGNIFICANT EMEAN-CMEAN=     -.07 DEG=  4 EMEAN=    40.67 EDEV=     2.25 CMEAN=    40.73 CDEV=     2.97
             DAY NUMBER    5
CADMIUM  T=       .50 NOT SIGNIFICANT EMEAN-CMEAN=      .03 DEG=  4 EMEAN=     1.10 EDEV=      .00 CMEAN=     1.07 CDEV=      .12
CHROMIUM T=     29.57  SIGNIFICANT    EMEAN-CMEAN=    38.17 DEG=  4 EMEAN=    70.83 EDEV=     2.20 CMEAN=    32.67 CDEV=      .42
COPPER   T=     15.06  SIGNIFICANT    EMEAN-CMEAN=    11.00 DEG=  4 EMEAN=    21.30 EDEV=     1.23 CMEAN=    10.30 CDEV=      .30
NICKLE   T=     24.77  SIGNIFICANT    EMEAN-CMEAN=    42.10 DEG=  4 EMEAN=    75.47 EDEV=     2.61 CMEAN=    33.37 CDEV=     1.37
LEAD     T=      8.57  SIGNIFICANT    EMEAN-CMEAN=     8.43 DEG=  4 EMEAN=    16.87 EDEV=     1.52 CMEAN=     8.43 CDEV=      .78
ZINC     T=      8.69  SIGNIFICANT    EMEAN-CMEAN=     6.23 DEG=  4 EMEAN=    49.53 EDEV=      .90 CMEAN=    43.30 CDEV=      .85
             DAY NUMBER   25
CADMIUM  T=      9.19  SIGNIFICANT    EMEAN-CMEAN=      .43 DEG=  4 EMEAN=     1.47 EDEV=      .06 CMEAN=     1.03 CDEV=      .06
CHROMIUM T=      1.71 NOT SIGNIFICANT EMEAN-CMEAN=    -2.27 DEG=  4 EMEAN=    39.63 EDEV=     2.06 CMEAN=    41.90 CDEV=     1.01
COPPER   T=      2.44 NOT SIGNIFICANT EMEAN-CMEAN=    -1.03 DEG=  4 EMEAN=    13.53 EDEV=      .61 CMEAN=    14.57 CDEV=      .40
NICKLE   T=      2.76 NOT SIGNIFICANT EMEAN-CMEAN=    -5.23 DEG=  4 EMEAN=    36.67 EDEV=     1.97 CMEAN=    41.90 CDEV=     2.63
LEAD     T=       .04 NOT SIGNIFICANT EMEAN-CMEAN=     -.03 DEG=  4 EMEAN=     8.53 EDEV=     1.45 CMEAN=     8.57 CDEV=      .15
ZINC     T=      5.75  SIGNIFICANT    EMEAN-CMEAN=     8.70 DEG=  4 EMEAN=    39.80 EDEV=     1.68 CMEAN=    31.10 CDEV=     2.01
             DAY NUMBER   50
CADMIUM  T=      1.07 NOT SIGNIFICANT EMEAN-CMEAN=      .13 DEG=  4 EMEAN=     1.37 EDEV=      .15 CMEAN=     1.23 CDEV=      .15
CHROMIUM T=      6.71  SIGNIFICANT    EMEAN-CMEAN=     6.77 DEG=  4 EMEAN=    51.60 EDEV=     1.04 CMEAN=    44.83 CDEV=     1.40
COPPER   T=      9.41  SIGNIFICANT    EMEAN-CMEAN=     1.93 DEG=  4 EMEAN=    17.97 EDEV=      .06 CMEAN=    16.03 CDEV=      .35
NICKLE   T=      1.98 NOT SIGNIFICANT EMEAN-CMEAN=    -1.13 DEG=  4 EMEAN=    34.07 EDEV=      .38 CMEAN=    35.20 CDEV=      .92
LEAD     T=      7.87  SIGNIFICANT    EMEAN-CMEAN=     6.97 DEG=  4 EMEAN=    18.07 EDEV=      .68 CMEAN=    11.10 CDEV=     1.37
ZINC     T=      4.53  SIGNIFICANT    EMEAN-CMEAN=    11.13 DEG=  4 EMEAN=    52.53 EDEV=     3.33 CMEAN=    41.40 CDEV=     2.65
             DAY NUMBER   85
CADMIUM  T=      3.13  SIGNIFICANT    EMEAN-CMEAN=     -.23 DEG=  4 EMEAN=     1.63 EDEV=      .12 CMEAN=     1.87 CDEV=      .06
CHROMIUM T=      7.43  SIGNIFICANT    EMEAN-CMEAN=    21.10 DEG=  3 EMEAN=    91.70 EDEV=     2.79 CMEAN=    70.60 CDEV=     3.68
COPPER   T=       .53 NOT SIGNIFICANT EMEAN-CMEAN=     -.47 DEG=  4 EMEAN=    19.63 EDEV=     1.42 CMEAN=    20.10 CDEV=      .52
NICKLE   T=      1.72 NOT SIGNIFICANT EMEAN-CMEAN=    -4.87 DEG=  4 EMEAN=    48.90 EDEV=     4.88 CMEAN=    53.77 CDEV=      .40
LEAD     T=      1.72 NOT SIGNIFICANT EMEAN-CMEAN=     1.87 DEG=  4 EMEAN=     9.63 EDEV=      .25 CMEAN=     7.77 CDEV=     1.86
ZINC     T=      2.31 NOT SIGNIFICANT EMEAN-CMEAN=     7.30 DEG=  4 EMEAN=    42.53 EDEV=      .98 CMEAN=    35.23 CDEV=     5.39
             DAY NUMBER  125
CADMIUM  T=      2.24 NOT SIGNIFICANT EMEAN-CMEAN=      .17 DEG=  4 EMEAN=     1.83 EDEV=      .06 CMEAN=     1.67 CDEV=      .12
CHROMIUM T=      4.55  SIGNIFICANT    EMEAN-CMEAN=    12.67 DEG=  4 EMEAN=    78.07 EDEV=     2.30 CMEAN=    65.40 CDEV=     4.23
COPPER   T=       .78 NOT SIGNIFICANT EMEAN-CMEAN=     1.60 DEG=  4 EMEAN=    18.27 EDEV=      .45 CMEAN=    16.67 CDEV=     3.54
NICKLE   T=      1.92 NOT SIGNIFICANT EMEAN-CMEAN=    -2.37 DEG=  3 EMEAN=    36.23 EDEV=      .87 CMEAN=    38.60 CDEV=     1.98
LEAD     T=     17.05  SIGNIFICANT    EMEAN-CMEAN=    -4.37 DEG=  4 EMEAN=     3.17 EDEV=      .23 CMEAN=     7.53 CDEV=      .38
ZINC     T=     14.49  SIGNIFICANT    EMEAN-CMEAN=    11.97 DEG=  4 EMEAN=    32.73 EDEV=      .38 CMEAN=    20.77 CDEV=     1.38
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      URCHIN          INTERNAL      EXPERIMENT NO=2                                                        39
             DAY NUMBER   0
CADMIUM   NO EXPERMENT MEAN=        2.17 DEVIATION=      .06 NUM= 3
CHROMIUM  NO EXPERMENT MEAN=        7.37 DEVIATION=      .21 NUM= 3
COPPER    NO EXPERMENT MEAN=        4.45 DEVIATION=      .00 NUM= 3
NICKLE    NO EXPERMENT MEAN=       16.03 DEVIATION=      .45 NUM= 3
LEAD      NO EXPERMENT MEAN=       18.47 DEVIATION=     1.51 NUM= 3
ZINC      NO EXPERMENT MEAN=       27.33 DEVIATION=     2.79 NUM= 3
             DAY NUMBER   1
CADMIUM   T=       1.41 NOT SIGNIFICANT EMEAN-CMEAN=    -.07 DEG=  4 EMEAN=     1.97 EDEV=     .06 CMEAN=     2.03 CDEV=      .06
CHROMIUM  T=       7.77  SIGNIFICANT    EMEAN-CMEAN=     .93 DEG=  4 EMEAN=     8.93 EDEV=     .06 CMEAN=     8.00 CDEV=      .20
COPPER                  EMEAN=CMEAN                                  EMEAN=     4.45  EDEV=   .06  CMEAN=     4.45CDEV=    .00
NICKLE    T=       3.17  SIGNIFICANT    EMEAN-CMEAN=    1.23 DEG=  4 EMEAN=    20.10 EDEV=     .10 CMEAN=    18.87 CDEV=      .67
LEAD      T=       2.05 NOT SIGNIFICANT EMEAN-CMEAN=    2.40 DEG=  4 EMEAN=    20.07 EDEV=    1.80 CMEAN=    17.67 CDEV=      .93
ZINC      T=       1.51 NOT SIGNIFICANT EMEAN-CMEAN=   -2.37 DEG=  4 EMEAN=    24.43 EDEV=    2.62 CMEAN=    26.80 CDEV=      .70
             DAY NUMBER   5
CADMIUM   T=       7.78  SIGNIFICANT    EMEAN-CMEAN=    -.37 DEG=  4 EMEAN=     1.77 EDEV=     .06 CMEAN=     2.13 CDEV=      .06
CHROMIUM  T=       5.00  SIGNIFICANT    EMEAN-CMEAN=    3.80 DEG=  4 EMEAN=    18.70 EDEV=    1.31 CMEAN=    14.90 CDEV=      .10
COPPER    T=       8.46  SIGNIFICANT    EMEAN-CMEAN=    2.03 DEG=  4 EMEAN=    11.33 EDEV=     .38 CMEAN=     9.30 CDEV=      .17
NICKLE    T=       9.00  SIGNIFICANT    EMEAN-CMEAN=    7.40 DEG=  4 EMEAN=    39.17 EDEV=    1.19 CMEAN=    31.77 CDEV=      .78
LEAD      T=       5.06  SIGNIFICANT    EMEAN-CMEAN=    4.73 DEG=  4 EMEAN=    18.17 EDEV=     .25 CMEAN=    13.43 CDEV=     1.60
ZINC      T=       4.01  SIGNIFICANT    EMEAN-CMEAN=    7.90 DEG=  4 EMEAN=    43.20 EDEV=    3.21 CMEAN=    35.30 CDEV=     1.15
             DAY NUMBER  25
CADMIUM   T=       4.95  SIGNIFICANT    EMEAN-CMEAN=    -.23 DEG=  4 EMEAN=     1.43 EDEV=     .06 CMEAN=     1.67 CDEV=      .06
CHRUMIUM  T=       6.79  SIGNIFICANT    EMEAN-CMEAN=   20.93 DEG=  4 EMEAN=    38.33 EDEV=    2.95 CMEAN=    17.40 CDEV=     4.45
COPPER    T=       7.17  SIGNIFICANT    EMEAN-CMEAN=    3.87 DEG=  4 EMEAN=    15.07 EDEV=     .81 CMEAN=    11.20 CDEV=      .46
NICKLE    T=      10.53  SIGNIFICANT    EMEAN-CMEAN=   29.50 DEG=  4 EMEAN=    58.83 EDEV=    4.84 CMEAN=    29.33 CDEV=      .38
LEAD      T=       4.49  SIGNIFICANT    EMEAN-CMEAN=    4.40 DEG=  4 EMEAN=    26.37 EDEV=     .84 CMEAN=    21.97 CDEV=     1.47
ZINC      T=       8.05  SIGNIFICANT    EMEAN-CMEAN=   10.20 DEG=  4 EMEAN=    41.40 EDEV=    2.05 CMEAN=    31.20 CDEV=      .78
             DAY NUMBER  50
CADMIUM   T=       1.00 NOT SIGNIFICANT EMEAN-CMEAN=     .03 DEG=  4 EMEAN=     2.20 EDEV=     .00 CMEAN=     2.17 CDEV=      .06
CHROMIUM  T=       2.40 NOT SIGNIFICANT EMEAN-CMEAN=   -1.30 DEG=  4 EMEAN=    13.90 EDEV=     .60 CMEAN=    15.20 CDEV=      .72
COPPER    T=       2.71 NOT SIGNIFICANT EMEAN-CMEAN=    -.70 DEG=  4 EMEAN=    11.00 EDEV=     .44 CMEAN=    11.70 CDEV=      .10
NICKLE    T=       5.13  SIGNIFICANT    EMEAN-CMEAN=   -3.20 DEG=  4 EMEAN=    16.23 EDEV=     .78 CMEAN=    19.43 CDEV=      .75
LEAD      T=        .29 NOT SIGNIFICANT EMEAN-CMEAN=    -.20 DEG=  4 EMEAN=    23.47 EDEV=    1.00 CMEAN=    23.67 CDEV=      .65
ZINC      T=       1.62 NOT SIGNIFICANT EMEAN-CMEAN=   -4.40 DEG=  4 EMEAN=    27.37 EDEV=    3.13 CMEAN=    31.77 CDEV=     3.51
             DAY NUMBER  85
CADMIUM   T=       5.00  SIGNIFICANT    EMEAN-CMEAN=     .17 DEG=  4 EMEAN=     2.37 EDEV=     .06 CMEAN=     2.20 CDEV=      .00
CHRUMIUM  T=      53.67  SIGNIFICANT    EMEAN-CMEAN=   42.33 DEG=  4 EMEAN=    70.77 EDEV=     .45 CMEAN=    28.43 CDEV=     1.29
COPPER    T=       9.60  SIGNIFICANT    EMEAN-CMEAN=    4.97 DEG=  4 EMEAN=    15.47 EDEV=     .23 CMEAN=    10.50 CDEV=      .87
NICKLE    T=      25.94  SIGNIFICANT    EMEAN-CMEAN=   25.90 DEG=  4 EMEAN=    47.50 EDEV=     .95 CMEAN=    21.60 CDEV=     1.44
LEAD      T=       7.06  SIGNIFICANT    EMEAN-CMEAN=    5.57 DEG=  4 EMEAN=    20.30 EDEV=     .87 CMEAN=    14.73 CDEV=     1.05
ZINC      T=       1.83 NOT SIGNIFICANT EMEAN-CMEAN=     .73 DEG=  4 EMEAN=    42.53 EDEV=     .06 CMEAN=    41.80 CDEV=      .69
             DAY NUMBER 125
CADMIUM   T=       4.47  SIGNIFICANT    EMEAN-CMEAN=     .33 DEG=  4 EMEAN=     2.37 EDEV=     .06 CMEAN=     2.03 CDEV=      .12
CHROMIUM  T=      12.05  SIGNIFICANT    EMEAN-CMEAN=   10.63 DEG=  4 EMEAN=    28.27 EDEV=    1.53 CMEAN=    17.63 CDEV=      .06
COPPER    T=      26.77  SIGNIFICANT    EMEAN-CMEAN=   10.97 DEG=  4 EMEAN=    20.80 EDEV=     .36 CMEAN=     9.83 CDEV=      .61
NICKLE    T=       2.38 NOT SIGNIFICANT EMEAN-CMEAN=    3.83 DEG=  4 EMEAN=    34.53 EDEV=    2.64 CMEAN=    30.70 CDEV=      .90
LEAD      T=      11.57  SIGNIFICANT    EMEAN-CMEAN=   23.80 DEG=  4 EMEAN=    46.90 EDEV=    2.85 CMEAN=    23.10 CDEV=     2.14
ZINC      T=       6.46  SIGNIFICANT    EMEAN-CMEAN=   18.67 DEG=  4 EMEAN=    54.70 EDEV=    3.95 CMEAN=    36.03 CDEV=     3.07
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      URCHIN        SHELL           EXPERIMENT NO=2                                                                         40
           DAY NUMBER    0
  CADMIUM   NO EXPERMENT MEAN=      2.93 DEVIATION=        .15 NUM= 3
  CHROMIUM  NO EXPERMENT MEAN=      5.03 DEVIATION=        .76 NUM= 3
  COPPER    NO EXPERMENT MEAN=      4.45 DEVIATION=        .00 NUM= 3
  NICKLE    NO EXPERMENT MEAN=     14.30 DEVIATION=       2.03 NUM= 3
  LEAD      NO EXPERMENT MEAN=     31.83 DEVIATION=       1.11 NUM= 3
  ZINC      NO EXPERMENT MEAN=      4.37 DEVIATION=        .06 NUM= 3
           DAY NUMBER    1
  CADMIUM   T=      1.11 NOT SIGNIFICANT EMEAN-CMEAN=     .13 DEG=  4 EMEAN=     2.90 EDEV=      .20 CMEAN=     2.77 CDEV=      .06
  CHROMIUM  T=      1.06 NOT SIGNIFICANT EMEAN-CMEAN=     .23 DEG=  4 EMEAN=     5.47 EDEV=      .23 CMEAN=     5.23 CDEV=      .31
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .23  CMEAN=     4.45CDEV=     .00
  NICKLE    T=       .62 NOT SIGNIFICANT EMEAN-CMEAN=    -.30 DEG=  4 EMEAN=    14.53 EDEV=      .78 CMEAN=    14.83 CDEV=      .32
  LEAD      T=      1.74 NOT SIGNIFICANT EMEAN-CMEAN=     .13 DEG=  4 EMEAN=    30.57 EDEV=     1.03 CMEAN=    28.43 CDEV=     1.86
  ZINC      T=      1.94 NOT SIGNIFICANT EMEAN-CMEAN=     .47 DEG=  4 EMEAN=     5.07 EDEV=      .12 CMEAN=     4.60 CDEV=      .40
           DAY NUMBER    5
  CADMIUM   T=       .44 NOT SIGNIFICANT EMEAN-CMEAN=     .13 DEG=  4 EMEAN=     2.80 EDEV=      .46 CMEAN=     2.67 CDEV=      .25
  CHROMIUM  T=       .21 NOT SIGNIFICANT EMEAN-CMEAN=    -.07 DEG=  4 EMEAN=     5.00 EDEV=      .26 CMEAN=     5.07 CDEV=      .49
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .26  CMEAN=     4.45CDEV=     .00
  NICKLE    T=      1.37 NOT SIGNIFICANT EMEAN-CMEAN=    -.53 DEG=  4 EMEAN=    13.37 EDEV=      .65 CMEAN=    13.90 CDEV=      .17
  LEAD      T=      1.56 NOT SIGNIFICANT EMEAN-CMEAN=   -1.50 DEG=  4 EMEAN=    28.43 EDEV=     1.46 CMEAN=    29.93 CDEV=      .81
  ZINC      T=     11.62  SIGNIFICANT    EMEAN-CMEAN=    4.37 DEG=  4 EMEAN=    19.97 EDEV=      .55 CMEAN=    15.60 CDEV=      .35
           DAY NUMBER   25
  CADMIUM   T=       .41 NOT SIGNIFICANT EMEAN-CMEAN=     .10 DEG=  4 EMEAN=     2.13 EDEV=      .40 CMEAN=     2.03 CDEV=      .12
  CHROMIUM  T=      1.31 NOT SIGNIFICANT EMEAN-CMEAN=     .37 DEG=  4 EMEAN=     7.60 EDEV=      .36 CMEAN=     7.23 CDEV=      .32
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .36  CMEAN=     4.45CDEV=     .00
  NICKLE    T=      1.75 NOT SIGNIFICANT EMEAN-CMEAN=   -1.23 DEG=  4 EMEAN=     8.53 EDEV=      .67 CMEAN=     9.77 CDEV=     1.03
  LEAD      T=       .67 NOT SIGNIFICANT EMEAN-CMEAN=    1.53 DEG=  4 EMEAN=    48.30 EDEV=      .89 CMEAN=    46.77 CDEV=     3.89
  ZINC      T=       .43 NOT SIGNIFICANT EMEAN-CMEAN=    -.13 DEG=  4 EMEAN=     9.20 EDEV=      .53 CMEAN=     9.33 CDEV=      .06
           DAY NUMBER   50
  CADMIUM   T=       .25 NOT SIGNIFICANT EMEAN-CMEAN=    -.03 DEG=  4 EMEAN=     2.67 EDEV=      .21 CMEAN=     2.70 CDEV=      .10
  CHROMIUM  T=       .73 NOT SIGNIFICANT EMEAN-CMEAN=    -.37 DEG=  4 EMEAN=     5.23 EDEV=      .61 CMEAN=     5.60 CDEV=      .62
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .61  CMEAN=     4.45CDEV=     .00
  NICKLE    T=       .55 NOT SIGNIFICANT EMEAN-CMEAN=    -.37 DEG=  4 EMEAN=    10.60 EDEV=     1.06 CMEAN=    10.97 CDEV=      .46
  LEAD      T=       .10 NOT SIGNIFICANT EMEAN-CMEAN=     .27 DEG=  4 EMEAN=    39.83 EDEV=      .93 CMEAN=    39.57 CDEV=     4.58
  ZINC      T=      1.17 NOT SIGNIFICANT EMEAN-CMEAN=   -1.63 DEG=  4 EMEAN=    13.43 EDEV=     1.65 CMEAN=    15.07 CDEV=     1.76
           DAY NUMBER   85
  CADMIUM   T=       .30 NOT SIGNIFICANT EMEAN-CMEAN=     .03 DEG=  4 EMEAN=     2.77 EDEV=      .12 CMEAN=     2.73 CDEV=      .15
  CHROMIUM  T=      2.78  SIGNIFICANT    EMEAN-CMEAN=   -1.30 DEG=  4 EMEAN=     8.13 EDEV=      .50 CMEAN=     9.43 CDEV=      .64
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .50  CMEAN=     4.45CDEV=     .00
  NICKLE    T=      4.44  SIGNIFICANT    EMEAN-CMEAN=    -.53 DEG=  4 EMEAN=    14.00 EDEV=      .17 CMEAN=    14.53 CDEV=      .12
  LEAD      T=       .40 NOT SIGNIFICANT EMEAN-CMEAN=    -.97 DEG=  4 EMEAN=    43.03 EDEV=     2.20 CMEAN=    44.00 CDEV=     3.54
  ZINC      T=       .98 NOT SIGNIFICANT EMEAN-CMEAN=    2.43 DEG=  4 EMEAN=    12.80 EDEV=     1.56 CMEAN=    10.37 CDEV=     4.03
           DAY NUMBER  125
  CADMIUM   T=      1.58 NOT SIGNIFICANT EMEAN-CMEAN=    -.17 DEG=  4 EMEAN=     2.50 EDEV=      .10 CMEAN=     2.67 CDEV=      .15
  CHROMIUM  T=      1.40 NOT SIGNIFICANT EMEAN-CMEAN=    1.00 DEG=  4 EMEAN=     6.80 EDEV=      .79 CMEAN=     5.80 CDEV=      .95
  COPPER                 EMEAN=CMEAN                                EMEAN=     4.45  EDEV=     .79  CMEAN=     4.45CDEV=     .00
  NICKLE    T=      1.68 NOT SIGNIFICANT EMEAN-CMEAN=   -1.63 DEG=  4 EMEAN=    15.07 EDEV=     1.36 CMEAN=    16.70 CDEV=     1.00
  LEAD      T=      1.23 NOT SIGNIFICANT EMEAN-CMEAN=    2.97 DEG=  4 EMEAN=    40.00 EDEV=     1.41 CMEAN=    37.03 CDEV=     3.93
  ZINC      T=      2.60 NOT SIGNIFICANT EMEAN-CMEAN=    3.03 DEG=  4 EMEAN=    14.43 EDEV=      .68 CMEAN=    11.40 CDEV=     1.90
```

APPENDIX C

Experiment II, Water Data

The column headings are defined as follows:

1.	E/C	E is data from experimental tank C " " " control "
2.	METAL	concentration (μg/ℓ) shown are for the defined metal, either Cd, Cr, Cu, Ni, Pb or Zn
3.	MEAN PART	values shown represent mean (μg/ℓ) concentration for particulate fraction
4.	SD PART	represents the standard deviation of the mean particulate function
5.	MEAN SOC	values shown represent mean concentration (μg/ℓ) for the soluble organic fraction (Retained on Amberlite resin)
6.	SD SOC	represents the standard deviation of the mean soluble organic fraction
7.	MEAN SIC	values shown represent the mean concentration (μg/ℓ) of the soluble inorganic fraction (Retained on Chelex-100^{R} resin)
8.	SD SIC	Represents the standard deviation of the soluble inorganic fraction

E/C	METAL	MEAN PART	SD PART	MEAN SOC	SD SOC	MEAN SIC	SD SIC
E	Cd	0.1	0.1	0.0	0.00	0.6	0.2
C		0.1	0.1	0.0	0.04	0.6	0.3
E	Cr	3.3	3.1	0.3	0.3	1.0	0.9
C		4.3	4.1	0.4	0.5	0.7	0.6
E	Cu	1.8	1.2	0.5	0.4	2.1	1.1
C		2.4	2.0	0.5	0.3	1.8	0.50
E	Ni	4.4	3.9	0.4	0.3	5.6	3.1
C		4.6	3.9	0.2	0.4	4.2	1.2
E	Pb	0.0	N/A	0.0	0.0	3.3	1.9
C		0.0	N/A	0.0	0.0	2.5	1.7
E	Zn	1.6	0.78	0.6	0.4	21.7	22.0
C		2.6	1.8	0.4	0.2	14.3	13.7

APPENDIX D

Wet/Dry Ratios

Wet/dry ratios are shown for each sample and tissue type for Experiments I and II. These values may be multiplied by the metal concentration (μg/g dry weight) values to obtain concentrations in μg wet weight.

Mean Wet/Dry Ratio ($\bar{x}$) with n (number of samples) and Standard deviation(SD) for all organisms sampled in Experiment I and II

Clam	N	$\bar{x}$	S.D.	N	$\bar{x}$	S.D.
Gut	12	10.6	1.80	13	10.7	1.20
Shell	12	1.0	0.02	12	1.1	0.00
Sea Cucumber						
Body	10	4.7	0.70	12	4.5	0.40
Gut	10	11.1	3.40	13	10.6	3.20
Muscle	9	9.6	0.90	Not determined, combined with gut		
Urchin						
Gut	10	15.7	3.60	12	10.7	2.30
Shell	9	2.0	0.10	13	2.0	0.20
Snail						
Gut	9	4.0	1.7	7	3.9	1.0
Shell	9	1.0	0.0	7	1.1	0.0
Oysters						
Gut	6	9.5	1.1	12	11.6	2.10
Shell	6	1.1	0.0	13	1.3	0.20
Thalassia						
Leaves	9	10.2	1.90	12	12.8	2.90
root/ Rhizomes	9	7.5	2.1	13	9.9	2.2
"Fouling organisms"	8	5.2	2.2	7	5.0	1.4
Sewage	2	14.8	7.10	7	8.7	4.1
Sediment	10	1.4	0.00	13	1.4	0.10
Mangroves						
Bottom of hypocotyl	7	3.3	0.60	7	3.4	0.60
Meristem above hypocotyl	7	3.4	0.60	7	4.0	0.40
Leaves	4	4.5	1.1	6	5.3	1.3
Roots	6	5.4	1.0	7	5.6	0.50